SUPPLEMENT.

The Mining Journal,

AILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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Original Correspondence.

IRON MINING IN DEAN FOREST.

sperous position of the iron trade for some time past, and profits realised by those engaged in the importation of res, have naturally caused attention to be turned to many in this country which have hitherto been neglected, and no entertained that many of these—especially such as are situ- ell-tried districts, although themselves not developed—will ood return upon the outlay required for working them. The ht iron ore beds in the Dean Forest district have been con- o possess great attractions, and more particularly so as some ccur in close proximity to coal seams, which, with the high fuel recently obtaining, cannot but be regarded as a highly t feature. Amongst the properties for the development of pital is about to be sought by the formation of a public com- ne at Oxenhall, in Gloucestershire, in the hands of Messrs. nd Aston, who being practical men have carried out the exploratory works for proving both the coal and the iron, xpended some 600*l.* in doing so. They now desire to secure er working of the mines, and as they consider 5000*l.* work- al would be ample for doing all the work necessary, there e no difficulty in making the desired arrangements.

regard to the fuel there appears to be sufficient on the estate purposes of the working, if one can judge from the account g operations which were conducted in 1791 by Mr. Dykes, Hon. Andrew Foley. The hole seems to have been com- on Dec. 20, 1790, and by Jan. 22, 1791, a depth of 23 yards d been reached. The character of the strata passed through n by the record of the work done to have been decidedly ble. After passing through—marl, 2 ft.; coal smut, 3 in.; coal clay, 2 ft.; coal, 5 in.; drift, 1 yard; coal, 9 in.; drift, ft.; a workable seam of COAL 1 ft. 6 in. was reached. Below re was found—drift, 2 yds. 1 in.; red marl, 2 yds. 6 in.; grey in.; marl, 3 yds. 2 in.; drift, 3 yds. 1 ft. 2 in.; and then COAL n., with drift 1 yd. 1 ft. 4 in. under it. Beneath this drift curs COAL, 1 ft. 1 in.; drift, 8 in.; and COAL, 2 ft. 9 in.; drift, ft. 6 in., making up the depth of 23 yds. 2 ft., already referred e depth reached. The record extends to the Saturday even- the statement of the position of the work at that time, ap- to the table by Mr. Dyke, was that they were in another n of coal when they left work. Of subsequent operations we record, although they were doubtless continued the follow- k. It will be seen that there are four workable seams of the aggregate thickness of 7 ft. 10 in.; but from their posi- me consideration would be necessary as to the best method of g them. The upper 1 ft. 6 in. seam would, of course, have orked by itself, and the most economic means of doing this nly be determined after careful examination of the strata. ree lower seams could probably best be worked simultaneously he long wall system in one working 11 ft. 4 in. high. The strata e removed one at a time, commencing with the upper coal, face moves forward, so that the coal might be obtained clean th little waste, whilst the drift would supply material for the alls. This would give the company the full advantage of the in. of coal for the entire area.

reference to the prospects of the workings, Mr. Wm. Perks, as engineer at the Hill House Colliery 30 years ago, writes ey had a pit there about 100 yards deep, and three veins of the top vein about 1 ft. thick; another, 1 ft. 8 in.; and the vein (wrought by them), 6 ft., with a good rock top, requir- t little timbering. The royalty was too small for long con- successful working, and they were not permitted to go where st coal was, as the property belonged to different parties, but tes that it will be found that where they left off at the boundary om the plan which he has marked the coal was good. He re- ends the sinking of a pit near the mill, where they will have n of some hundreds of acres. The party he was connected ad only a few acres, yet their take lasted for twelve years, which time they were so little troubled with water that rew it all with a barrel. There is another vein of coal below hich they worked, and he thinks the best place now to sink is west of the old colliery, and there will then be a good scope rking. In the pits now sinking he states that a good vein of ill be found a few yards deeper than the point now reached, nother pit should be sunk from 150 yards to 200 yards south. resent pit will then do for an air pit. The Hill House pits were d by Mr. Perkins in 1796, and he realised a fortune out of and the ground is altogether very favourable for working. erks considers they will want two pits for the proper opening f the mines, and is confident that the working of them will successful.

situation of the property for economic working is decidedly rable. The Gloucester Canal runs through the estate, and within ards of the pit by which the ore will be got; and as to the of the ore, it seems that a Staffordshire company is ready to it at 18*s.* per ton, and to pay the freight. It is proposed to sink nearer to the canal than that now worked, and this would give reat advantage that the iron and coal could be got through one . The water is so light that the cost of keeping the pit dry l be very small; indeed, in the pit now sinking one man can the water with an ordinary hand-pump. The extent of the rty is between 3000 and 4000 acres, and it is held from Mr. R. Onslow upon very favourable terms. It is within sight of the ey and Wigpool Works, and the coal royalty is included in the . The dead rent is fixed at 100*l.* per annum, and the royalty is . per ton on iron and 4½*d.* per ton on coal; it is estimated that ost of raising will not exceed 4*s.* per ton. The dead rent does merge into royalty, but in consideration of its payment the or undertakes to provide the necessary rights of way as re- d. Several exploratory pits 6 yards or 7 yards deep have been and both the coal and the iron have been traced for more than e and a half. The coal is of good quality, and the iron ore, can be taken by the canal boat direct from the property to urnaces, has been analysed by Mr. A. Norman Tate, F.C.S., of rpool, and found to contain 43½ per cent. nearly of metallic iron, onstituents of the ore being peroxide of iron, 60·00; protoxide of iron, 1·80; manganese, traces; alumina, 1·86; lime, 0·60; magnesia, 1·30; sulphuric acid, 0·90; phosphoric acid, traces; bisulphide of iron, none; water, hydroscopic, 2·20; combined, 4·06; insoluble residue, consisting of silica with traces of alumina, 27·28=100·00. It is understood that negociations are pending for bringing the property before the public, and that the prospectus of the company in process of formation will shortly be published.

THE FUTURE OF THE COAL TRADE.

The probable duration of our coal fields, and consequent decline of England's greatness as a power, has for several years past been very fully discussed by the ablest men of the time—by Sir R. I. Murchison, not long before his death, and recently by Sir W. Armstrong and others. The time has been variously estimated when the whole of our workable seams will have reached the verge of exhaustion, the data relied upon being the knowledge we have as to the present coal fields being worked, without taking into consideration the probability of others being discovered, as has been the case quite recently. Without, however, attempting to solve the problem as to what will be the actual position of England 1000 years hence, it will probably be considered just now of more interest if we notice what is likely to be the state of the coal trade during the next three or four years.

We may say that the evidence given before the Committee of the House of Commons with reference to the scarcity and high price of coal incidentally alludes to the progress being made in the development of our minerals, the dearth of miners, and the very little that has been done by colliery proprietors in the application of mechanical appliances to make up for the growing deficiency of manual labour in the working of mines. Nearly all the witnesses who were questioned as to the value of coal-cutting machinery appeared to know very little about it, although it must play a very important part in the future working of collieries.

Looking, in the first instance, to our supply and consumption of coal, we find that there are exceptional years, when they do not go side by side, as in 1872 and the early part of 1873. Last year the production was more by about 6,000,000 tons than in the preceding one; yet it was insufficient to meet the demand. The effect was not only to immediately advance prices to a point hitherto unknown in the history of the coal trade, but also to lead to the purchase of immense coal fields in all parts of the kingdom. It is to the latter, then, that the greatest attention will be paid, seeing that the many new mines being opened out must tell most materially not only on future supplies but on prices as well. If we take one part of the kingdom—that known as the Midland coal field, the largest in England, extending from Nottingham to Leeds in an almost straight line—new collieries are being opened out throughout its entire length. In the North of England, Staffordshire, Shropshire, Lancashire, Wales, and, in fact, in every mining district in the kingdom, new pits are being sunk. At many of those collieries the output is estimated at no less than 1000 tons a day; at others it is put down at 200,000 tons a year, for all the concerns being opened out are on a very large scale. What the actual increase in the production during the next three or four years will be it is hard to say, but it will be very far in excess of what has ever been known before. If we take the Midland field alone, we believe we shall be considerably inside the mark if we estimate the increase in 1875 at 7,000,000 tons more than it was last year. If other districts increase in anything like the same proportion we should have, taking a very moderate calculation, 30,000,000 tons more coal raised in 1875 than there were in 1872. This we have every reason to believe will be far more than will be required, for we find that the high prices which have prevailed in England have led to not only great economy in its use, but more attention being paid to the development of the coal fields of Europe, the United States, and British America. In fact, at the present time the best steam coal is being put free on board at Cape Breton at $2 40 c. per ton—half the price it is in England. We may then expect for the next three years that new coal mines will be opened out in this country, and their output from time to time sent into the markets, so that no scarcity, we consider, need to be at all apprehended, whilst the prices cannot be so high as they were in the early part of the present year.

Returning, then, to our own coal fields, and the rapid development now going on, we have the facts staring us in the face, as given in evidence before Mr. Mundella's committee, that colliers are scarce, and that the effect of recent legislation has tended to exterminate the entire race of actual miners. These appear to be very serious matters indeed. Still, if even correct in every particular, we believe the difficulties are not such but what can be surmounted. If during the next three years there is a demand for some 40,000 miners, and they are not forthcoming, colliery owners will have to look to other means for getting coal. This they can easily obtain by taking advantage of the mechanical appliances that are placed within their reach, and with regard to which so little is known by the majority of those most interested. To those, however, who have paid any attention to the number of coal-cutting machines patented, and those at present at work, surprise is felt that they have not come into more general use than they have done, for even now we do not believe there are more than 30 in use in the whole of the kingdom. But that they can be profitably worked in nearly all mines—especially in those where the coal is got by the long wall system—has been abundantly shown. Amongst those who have done most to perfect machinery for getting coal Messrs. Firth, of Leeds, undoubtedly stand the first, for they have spared neither time nor money in making the pick machine as perfect as it almost can be. Some 10 or 12 of their machines are now to be seen at work in the pits of the West Ardsley Company, at Leeds—a proof that they have in every way been a great success, for one of them will cut the coal at the rate of 30 yards an hour. Mr. F. Hurd, of Wakefield, has also been a successful inventor, and, with Mr. S. Firth, has recently patented a double-pick machine, of rather novel construction. The axle of one pick, it appears, passes through the hollow axle of the other, and to each axle is fixed a lever, which is connected by links to the cross-head of the piston-rod in such a manner as to make one pick strike whilst the other is coming out of the groove. Mr. Hurd, in connection with Mr. Simpson, a wealthy coalowner, has also patented an invention which, if successful, will do more to cause coal-cutting machines to be generally adopted than anything else. It is a means of compressing the air for working the machines in any part of a mine, either by manual or horse-power, and so doing away with the great expense of sending the air from the surface to the workings by means of pipes. Messrs. Baird, of Gartsherrie, near Glasgow, are also patentees of a machine, worked by a jib with a chain-cutter, a notice of which has already appeared in the Journal. By it, it is said, from 25 to 30 yards of coal can be undercut in the course of an hour. Messrs. Gillott and Copley, of Barnsley, have also a patent for a coal-cutter, that by means of a cast-steel wheel, 3 ft. 4 in. in diameter, the projection of the cutting tools not exceeding 3 ft. 10 in., undercuts the coal to a depth of 3 ft. 4 in. at the rate of nearly 30 yards an hour. The machine is now being successfully worked. Machines by other persons have also been satisfactorily tested, but owing to the very little encouragement given by colliery owners many of them have been abandoned. As to the economy of the machines over the pick, wielded by hand, there is no question whatever.

In some very thin beds in West Yorkshire, where the coal is very little more than 1 ft. thick, it costs upwards of 6*s.* a ton in getting, whilst in the thick beds in South Yorkshire, where the seams are from 8 to 9 ft. thick, the collier will not get more than 2*s.* per ton. On the other hand, a patentee of one of the machines has offered to provide all the power and appliances, and cut the coal at the rate of not more than 1*s.* 6*d.* per lineal yard. Taking a bed of coal, then—say, 6 ft. 6 in. thick—a yard would produce about 2 tons, and assuming that a collier cut and cleared away 7 yards a day, he would in the course of a week produce 42 tons—not bad work—at a cost of 5*l.* On the other hand, a coal-cutting machine, "holing" 25 yards an hour, for eight hours a day, would give 2400 tons in a week—or equal to what could be gotten by at least 50 men. With these facts in view, it will be apparent that coal will have to be worked by machinery in most of our mines, and by which means the ventilation of the places will be improved, the coal got in a more marketable condition, and the most laborious as well as the most dangerous part of the miners' work done away with. Thus, the rapidity of production and the low price at which coal can be worked by machinery will compel most large colliery proprietors to adopt it, for it will be found that hand labour can in no way compete with the coal-cutter.

We, therefore, look hopefully forward to the next two or three years, believing that the year 1875 will see a very great change in the mode of getting coal, and that by the aid of machinery there will be scarcely any limit to the output. Whilst, as has been the case with regard to all other commodities where machinery has superseded manual labour, not only the producer but the public will alike be benefitted. We also expect to see by the time we have named several new fields of coal broken into, more especially to the north-east of the present Leicestershire mining district, one gentleman having, we understand, recently stated that he intended boring on his estate not far from the Vale of Belvoir, and we have no doubt he will be supported in so doing by the other landowners in the locality. In Lancashire, also, it is by no means improbable that coal will be found in the western part, not far from Preston and Garstang. The prospects as to our future supplies of coal are, then, in every way healthy and encouraging, and we believe that only a comparatively short time will elapse before coal is not only plentiful, but in such abundance as will lead to its being purchased at a reasonable cost. By the adoption of machinery, which will become a positive necessity, and not a matter of choice, we shall be free from strikes, the limitation of working hours, as well as the limitation of the output of coal. We shall also be able to maintain our prestige as the great mining and manufacturing centre of this world. As to the exhaustion of our coal, we believe that new fields of it will be brought to light from time to time that will render the date of the decline of England's greatness owing to the want of minerals a matter of speculation for the geologists of 1000 years hence, as it has been for those in our own day.

ROYAL CORNWALL POLYTECHNIC SOCIETY.

Although recording an unusually large number of deaths amongst the earlier and more energetic members of the society, the fortieth annual report, just printed, is by no means unfavourable; it indicates, however, that strenuous exertions on the part of all connected with the institution are absolutely necessary to secure its future prosperity, for it is at present over 200*l.* in debt, and the Exhibition of 1872 (one of especial interest, and well attended by members of the society, its attractiveness being much increased by the series of lectures arranged in connection with it) did not cover its expenses. The fear is expressed that the Society will have to reduce considerably its expenditure for future exhibitions, by declining many exhibits, especially those from a distance, and by reducing the amount of prizes offered, unless the income from members' subscriptions can be considerably increased. It is remarked that for many years the mechanical department has been somewhat poorly represented in the annual exhibition, but last year a great improvement was evident in this department both in the number and character of the articles exhibited. As the county is to be visited during the coming summer by the Institution of Mechanical Engineers, it is hoped that in the Exhibition of 1873 the mechanical department will be still better represented, so that it may be the feature of the year. The inaugural address of the President (Mr. Charles Fox) contains a vast fund of information, and the reports of the judges of the several sections are particularly interesting. The volume contains also a good account of the lectures delivered during the exhibition—Mr. Worth's "Historical Notes concerning the Progress of Mining Skill in Devon and Cornwall; a valuable paper "On Local Botony," by Mr. C. B. Allen; another "On the Prehistoric Antiquities of Dartmoor," by Mr. C. Spence Bate, F.R.S.; and illustrated descriptions of many of the mechanical inventions exhibited, so that the volume itself should become a fair source of revenue to the Society.

With regard to the current year the list of premiums and prizes has not been at all curtailed, so that it possesses ample attractions for competitors. In the mechanical department there are premiums of 10*l.* for the best model and 5*l.* for the best plan for improving the ventilation of mines; a premium of 5*l.* by the Editor of the *Mining Journal* for the best paper containing an account of any methods or plans practised in any other mining districts advantageously applicable to the Cornish mines; premiums of 10*l.* by Capt. Teague and the adventurers in Tincroft for the best practical suggestions as to the motive-power to be employed in driving boring-machines in Cornish

mines, including the method of conveying the power to the machine; premiums of three, two, and one guineas for models of portable steam-stamps; a premium of 5*l.* 5s. for the best working plan of a mine in full operation; and premiums of 5*l.* 5s. by the Society, and 5*l.* 5s. by a friend, for models or plans of a new, safe, and effectual contrivance for lowering and raising miners, more economical in its first outlay than the man-engine, and not more expensive in working. In the other sections of the same department there are numerous premiums and prizes from 5*l.* downwards for models, natural philosophy, chemical analysis, optical instruments, naval architecture, statistics, essays, scientific papers, &c., many of them being offered specially for boys under 15 and under 12 years old respectively. The departments of fine arts, photography, and natural history are equally well encouraged by the offer of premiums, and there are numerous prizes for school productions, needle work, and British lace. Thus, every class of the community should feel an interest in the institution, for it is evident that its object is to extend the benefits of thoughtfulness and continued progress to the entire county; and it may be hoped that all will work harmoniously together, not only to relieve the Society of its indebtedness, but to enable it to be even more useful than it has been hitherto.

TIN MINING, AND TIN DRESSING.

SIR,—It is equally the case now as of yore that to assail popular errors is to incur popular reproach. Mr. Ennor has quoted the oft-repeated maxim that "What everyone says must be true." Every man of observation and reflection knows that such is not the case. An error in the practical working of a system is sometimes discovered after its practical endorsement by successive generations of men, and not unfrequently after its discovery numerous corrections and so-called improvements are proposed which, when reduced to practice, are found to be as faulty as those they were intended to supersede. When men professedly espousing the same side of a controverted question are found to differ on fundamental points it must be admitted that instead of strengthening they weaken each other's position: this is the case with Mr. N. Ennor and Capt. Parkyn. The former, appearing as the voluntary apologist of the latter, says in effect that I need not to have interfered with his plans, "but should have allowed him to work out his own salvation;" and adds, "if he failed it is only what hundreds have done before him." Capt. Parkyn, on the other hand, affirms that the system of dressing referred to has been in operation for 10 years, and proved a success. There is a curious discrepancy here to arise between men who pretend to know what they are writing about.

I have for a long time regarded the dressing of both tin and lead ores as by far the most important items in these several fields of mining, and whilst no one would think of denying that an important percentage of these ores are annually carried off with the refuse from the mines it is to be regretted that that fact has been made a handle of for other purposes than that of correcting the defectiveness in the system complained of. I am too well acquainted with tin-dressing not to know the difference between tin found in partially decomposed elvans and that found in the fine tinstone of many of the mines of West Cornwall, and of the necessary difference which should be observed in the treatment of the two classes of ore in dressing. The cardinal principle in the dressing of ores is based upon the difference in their specific gravity and that of the minerals with which they are associated. This is a principle, it is well understood, which must ever obtain in the concentration of ores, whether by the agency of water or atmospheric air, and of the principle itself there can be no modification, that can only hold good in respect of the appliances. Modified instrumentalities are essential to adapt the appliances in general use to the primary differences which are found to exist in nature and are known to affect, as it regards concentration, the various classes of tin and all other ores, and it is often necessary to extend such modifications beyond the clearly defined line of precedent, in which cases respectively the necessary arrangements become a device, and should be credited to the person or persons contriving them. But modifications, such as those relating to mere detail, are almost of daily occurrence, and, not unfrequently, what is found to be beneficial in some cases is quite the reverse in its application to others, and the miner that does not know this ought not to boast of the extent of his experience.

If anything denotes narrowness of mind it is a contracted mental vision; and the man who has never taken a higher outlook upon the great world around him than from the little mound raised by his own conceit is not in a position to draw fair comparisons. Capt. Parkyn's arrangement may include some improved modifications as relating to the particular class of ores they were intended to treat, but if that were so it was wrong to assume, as well as a reproach upon mining, that independent motive-power for working the dressing machinery was a thing unknown until he introduced it. It was this and kindred assumptions which induced me to write, and not any feeling entertained against Capt. Parkyn, or prejudice against his arrangements; and the remarks to which I took exception were not contained in his letter, but in the letters of others, one of which related to the spalling of the tinstuff, and the other to its subsequent treatment, which was as follows:—"The designer evidently believes in employing the simple laws and materials of nature whenever he can to advantage, and he is certainly to be congratulated upon the use he makes of water, which here performs at no expense, and in a very superior manner, what in many other mines is done at great cost by men, boys, women, and steam-power." The phraseology here employed admits inferentially that many others besides Capt. Parkyn were availing themselves of all local advantages afforded them by water, &c.; that being so, why make it appear that he was the first to introduce those methods which it is also inferentially admitted he had copied from others? The writer then goes on to say—"There is also great advantage gained in substituting a water-wheel in place of a connection with the engine for working the round buddles, which may be easily extended to the packing of steering keives—a matter of detail." That writer does not seem to be aware that buddling is a matter of the same kind. Then he adds, "There is the facility afforded for washing away the tails of the round buddles, and saving what tin may be in them, instead of wheeling or tramming away such a mass of sand to some distance, and losing the ore."

The above are extracts from the letter of "Plumbum Album," published in the Supplement to the Journal of April 26. Now, I would like to ask that writer when he penned these remarks whether he did not intend to convey the idea that the methods referred to were entirely new, and the products of Capt. Parkyn's fertile genius? This position, whether he knows it or not, involves him in a dilemma. If he believed them to be new he must have been vastly ignorant of the subject upon which he wrote, but if he did not believe them to be new for what purpose did he represent them as such? The packing of keives by machinery has been in operation for upwards of 20 years, and not only so but the tossing-steering part, as he called it, has been done by the same machinery. What will his gladiatorship say to this after having taken credit on Capt. Parkyn's behalf for less than a moiety of the device, and held it up to public view, and extolled it as a wonderful achievement of his friend's genius, and that, too, whilst it yet remained in the dormant state of a conception or proposition in the great mind of the designer? And, as to independent water-wheels for working round buddles, &c., I have had as many as six at work regularly at a single mine, and for removing tailings from the round buddles water was invariably employed.

I am asked to point out what I consider defective in Captain Parkyn's dressing arrangements. It is singular that what I said respecting the defectiveness of his pretensions, or those put forth in his behalf, should have been applied to the arrangements concerning which the pretensions were made. I said that they were not new, but admitted modifications, which, if they are proved to be valuable, he or someone about him may deserve credit for them. The utmost that I said about the *floors* themselves was that they were not adapted to "save all the tin," and it is marvellous that any man who has had experience in tin-dressing should set up such a pretence. I have no hesitation in saying that if 1 lb. of black tin be taken from the tin-hutch in any mine, and be subjected to pulverisation in a mortar under the action of water, and then passed from vessel to vessel in the open air, sometimes dry and sometimes wet, and then allowed to remain under water in vessels of the finest porcelain, and changed from time to time as many times in the aggregate as tinstuff is handled over from the shaft's mouth to the tin-hutch with all the care which could possibly be exercised by human vigilance, the 1 lb. of tin at the expiration of the process would have sensibly diminished. It is utterly impossible that all the tin can be saved. For that reason I have never previously written "Parkyn's Save-All Dressing Floors," and after this very probably never shall; I look upon the term as a misnomer. To take exception to any of his arrangements is what I never thought of doing; besides, I do not know how his modified appliances work, and I have no means of knowing without going on to the ground and making sundry tests and observations which might extend over a week. I took exceptions to what I called assumptions, and these I maintain, and no one can prove to the contrary. If my generous opponents were about half the number that they are there might be some show of reason in their asking me to make some considerable concessions in their favour, but as it is I think they are a little too exacting and unfair in requiring me to prove my own position and to disprove theirs.

It would be worse than useless to notice the letters of this cliqne singly. The ravings of "Plumbum Album" are a sort of wild parody on my letter; and the untruthful nothings and hypocritical cant of "Cornubiensis" would pall upon the stomach if contemplated, and cause nauseau; whilst the characteristic rambling of Mr. N. Ennor, who goes from the Land's End to John O'Groats House in no time, and thence no one knows whither, it would be utterly impossible to follow. But if either the latter gentlemen or Capt. Parkyn wishes to duscuss the points to which I have taken exception—*vide* my letter of May 3—and also the question of the Great Royalton Mines having paid a profit of 100*l.* per month from tinstuff which produced only 5 lbs. of black tin to the ton; or any other mines—proper—within the meaning of the term which it is alleged are being worked at a profit of 300*l.* per month on tinstuff producing only 5 lbs. to the ton. Whether it be called Mulberry, Wheal Buck, or by any other name, I am prepared to enter upon such discussion; but tin streams and china-clay works are not mines, and the importation of such matters will be treated by me as subterfuge.

With regard to personalities, as they relate to the past, I have yet to learn that I have committed myself in any way. But if calling a man by his proper name is the sum total of the charge preferred, then I must acknowledge that, in common with all the rest, I have done so; but I have applied no approbious epithets to anyone, called no one a fool or a knave, nor charged anyone with being insane. I called Capt. Parkyn by no other name than his own, and if he has been stung by any remark I have made it has been from the force of its truth and not its scurrility; and if has been ashamed of his name in any of the connections in which it has been used, his own zealous and not very discreet friends should be blamed for introducing him, and himself for endorsing them, and not me.

MINE AGENT.

POWER AND DUTY OF STEAM-ENGINES.

SIR,—As no one up to this has taken up the enquiry of "Engineman," in the Journal of May 10, I venture to submit the following—presuming that the Cornish engine is referred to. In the first place I would remark that it is usual in this type of engine to assume 22½ square inches of piston area as equal to 1-horse power, so that by this rule the 60-inch engine having a piston area of 2827 square inches would be:—

$$\frac{2827}{22{\cdot}5} = 125 \text{ h.p.}$$

In order, however, to estimate the *actual* horse power, it is necessary to know certain main points—as working pressure, ratio of expansion, condition of vacuum, velocity of piston, and for *exactness*, also several other matters; but it will be, perhaps, sufficiently near the truth to assume the following:—

1.—Steam pressure in boiler 60 lbs. per square inch from vacuo.

2.—Ratio of expansion 1 to 5—*i.e.*, the connection of cylinder with boiler is closed on the piston, having moved through one-fifth, or 2 feet, of its stroke.

3.—For imperfect vacuum—*i.e.*, as a constant resistance against the under surface of the piston—3 lbs. per square inch may be assumed as about correct in good engines of this class.

4.—The number of "in" strokes per minute at 6.

The *indicated* horse-power developed by the steam under these circumstances may be estimated as follows:—

Area of piston × mean effective pressure × length of stroke × strokes per minute.
33,000

The area of piston, 60 in. diameter, is 2827 square inches.
The pressure of steam in boiler is ..... 60 lbs.
Deduct for loss of pressure in passage ..... 3 lbs.
Initial pressure on piston ..... 57 lbs.

The ratio of expansion is as 1 to 5; and from subjoined table the multiplier or co-efficient for the ratio is 0·51. Therefore—

57 × 0·51 = 29·07 lbs.
Less back pressure 3·00 lbs.
Remains ..... 26·07 lbs., or, say,

26 lbs. per square inch mean effective pressure throughout the stroke. Then—

$$\frac{2827 \times 26 \times 10 \times 6}{33{,}000} = 133{\cdot}64 \text{ h.p.}$$

Of this only about 70 per cent. should be taken as actually engaged in lifting water (considering friction by working parts, &c.), so that we have—

$$133{\cdot}64 \times 0{\cdot}70 = 93{\cdot}5 \text{ h.p.},$$

as actual net work done under the conditions assumed. Of course, with higher initial steam pressure, less expansion, and greater velocity, more power would be got out of the engine.

Now, as to the duty:—The engine would draw from the boiler

$$\frac{2827 \times 24 \times 6}{1728} + 20$$

per cent. for waste and condensation in pipes, passages, &c., 283 cubic feet of steam per minute, or 283 × 60 = 16,980 cubic feet per hour. At a tension of 60 lbs. the ratio of steam to the water from which it is produced is as 467 to 1; therefore the boiler would require to evaporate per hour—

$$\frac{16{,}980}{467} = 36{\cdot}34 \text{ cubic feet, or 2271 lbs. of water.}$$

Allowing the coals used and the construction of the boiler to be capable of evaporating 7 lbs. of water per 1 lb. of coal, the consumption of fuel would be—

$$\frac{2271}{7} = 324{\cdot}43 \text{ lbs. per hour,}$$

or at the rate of 2·43 lbs. per indicated, or, 3·47 lbs. per net horse-power per hour. Then, $\frac{33{,}000 \times 84 \times 60}{3{\cdot}47} = 48{,}000{,}000$ lbs. lifted 1 foot high by the consumption of 1 bushel (84 lbs.) of coal.

The co-efficients for different ratios of expansion are as follow:—

Ratios	1	¾	½	⅓	¼	1·5	⅕	1·7	⅙	1·10
Co-efficients	1	0·94	0·82	0·68	0·58	0·51	0·46	0·42	0·38	0·32

ENGINE.

AIR-COMPRESSING PUMPS.

SIR,—Noting the paper and discussion upon compressed air for mining purposes, I was much surprised that no reference was made to a class of compressor which has of late come into considerable employment, and found so very superior to the older form and principle of compressing apparatus. I allude to the class of compressors in which the piston or plunger (as the case may be) operates in a cylinder *internally* supplied with water instead of externally, which have been proved to yield very high results. Another advantage is that the temperature of the air is but very slightly raised, and that the percentage of effect differs but very slightly at high or low velocities, or at high or low pressures.

Some experiments carried out in July, 1868, with two systems of pumps—the common compressor, with external coating, and the newer or internal oscillating water-column pump, consisting of a double-ended single-acting plunger of 15 in. diameter and 4 ft. stroke—fully demonstrated the great superiority of the latter system over the former. Whilst the common pump, constructed in every respect similar to the one exhibited in the British division of the Paris Exhibition, only gave an average effect of 66·01 per cent. (volume of air actually supplied compared with theoretic computation), the other gave no less than 96·62 per cent. At 28 lbs. pressure the common pump gave 69·45 per cent., and at 50 lbs. only 60·58 per cent., showing a very rapid decrease with increase of pressure. The plunger pump gave at 30 lbs. pressure 97·26 per cent., and at 42 lbs. 95·86 per cent. At a velocity of from 1½ to 2 double strokes per minute the common pump propelled *no air whatever* through the force valve, so that it was kept for the purpose of useful experiment at a velocity of 25 double strokes per minute.

At 4½ double strokes per minute of plunger pump, and 30 lbs. pressure, the useful effect of this pump was 95·47 per cent., and at 10½ strokes and same pressure, it was 97·64 per cent. And in regard to temperature of the compressed air, the results were still more in favour of the plunger pump, it only reaching 34° at 35 lbs. pressure, the temperature of external air and of the water being at the time of the experiment respectively 25° and 28°.

The pressures given above are in German pounds, equal to ½ kilo., and the temperatures are Reaumur scale.

ENGINE.

[The German Zollpfund = ½ kilo. = 17 ozs. 10 drams. To convert Reaumur degrees to Centigrade multiply by 1·25; to convert Reaumur to Fahrenheit multiply by 2·25 and add 32.]

LEGITIMATE MINING, AND ITS PROMOTION.

FACTS WELL WORTH KNOWING.

SIR,—It has been discussed in your valuable Journal if mining in foreign countries will pay English shareholders well if properties are put on the market here at anything like what they can be bought for either in America or Australia; but, unfortunately, this is not done one time out of five hundred. Almost all the financial houses in London are so grasping that they must have as much for putting the mine on the market as what the mine is to be bought at in the first place from the proprietors. For instance, I offered a mine the other day to a firm in the City to place on the market at 50,000*l.* I was told to call again in a few days, which I did, for their answer. The first question I was asked was what commission would I allow? I said 5 per cent., and 500*l.* for printing, stationery, &c. The answer was, We will take it, but you must allow us to sell it to the public at our own price. I then asked how much that would be? I was coolly told 100,000*l.* Well, Sir, I indignantly declined to have any dealings with them, as I know well that the mine would not pay great interest on a capital of 100,000*l.*, but it will pay splendidly on 50,000*l.*

Now, Sir, just fancy my position if I had been as unscrupulous as the parties I refer to, and let them sell them to the public at 100,000*l.* When my partners over the water heard that the company had been sold for such a sum they would naturally have supposed that I had "sold them" and gone in with people here for the plunder.

Now, Sir, I shall not join any house in London to extort money in that manner. I have several mines that I can put before the public which will pay large interest on the prices I am prepared to sell at. I am willing to allow a reasonable commission, and if I cannot have my business done by paying what is reasonable, honest, and fair I shall go more fully into the matter, through the *Mining Journal*, and tell the British public something more that I can thoroughly substantiate. I shall advertise the mines I have myself at the prices I have them for sale at, and not at 200 per cent. more than the proprietors are to have for their mine. Is there no regular scale of charges for brokers? If not, it is full time there was, both for Stock Exchange brokers and outside agents.—*London, June 5.*

JUSTICE.

THE FUTURE OF CORNISH MINING.

SIR,—Now that there is only one copper mine in Cornwall declaring dividends—namely, South Caradon—and not a single company in Devonshire yielding that ore even paying expenses, with the standard at 97*l.* 8s. to a produce of 6½ per cent. of metal—say, 10s. 7½d. per unit, or 53*l.* 12s. 3d. per ton, for copper, cost of fuel exorbitant, and likely to continue so, if not to advance, machinery and materials fully 40 if not 50 per cent. above their normal value a few years ago, the supply of labour daily becoming scarcer and the price demanded by the workmen gradually becoming higher, while hours of employment are lessened and the men more independent, we may surely ask, and with deep concern, too, What is to be the future of Cornish Mining? The great copper mines that formerly fostered the cupidity of capitalist, enlisting their active enterprise, while they fascinated the minds of adventurers, have long ceased to exist. We have no longer 20,000*l.*, up to 40,000*l.* and even 60,000*l.* a-year from a Tresavean, a Buller, a Basset, a Consols, a United, a Carn Brea, Dolcoath, Cook's Kitchen, Wheal Friendship, Crinnis, Godolphin, or even a prospective semblance thereof. We must, therefore, look upon copper mines as things of the past, and unworthy the attention of capitalists, unless landlords grant at one-hundredth dues, pay half the expenses of drainage until costs are met by revenue! while in cases of new companies being formed, the landlords should find funds to recoup promoters the outlay incurred in advertisements, printing, and preliminary expenses. In conclusion, Cornish copper mining ought to become extinct unless the owners of the soil grant leases without existing restrictions and at one-hundredth dues, land destroyed not to be paid for, dead rents unknown, and all buildings to be paid for at valuation by the landlords upon the cessation of workings, and the shafts protected at their expense, and not the retiring shareholders', when the adventures are proven worthless.

The tin mines of Cornwall are also in a sad state of transition, unless some method of preservation can be practically adopted—Dolcoath is an example of decline in dividend, showing unquestionable falling off, notwithstanding the production is as great as ever. Tincroft, Cook's Kitchen, and Carn Brea will, doubtless, exhibit signs of equal decadence during the current year; still, could not these results be obviated, or at least checked and ameliorated, if redressed in time? These "four" mines are substantially and to all intents "one." The workings communicate, and the prosecution of either demand the drainage of the whole group. A fusion of interests in these companies in the formation of one "federal" stock of (say) a million sterling, which is 300,000*l.* above their current value, would yield combined a profit of 150,000*l.* annually, or (say) 15 per cent. on the entire capital, with a reserve fund of 30 per cent. on capital in hand. The economy in working under one sound practical executive would save 40 per cent. in costs of drainage—discharge of ores and debris from underground, dressing, carting, smelting, carpentry, agency, sub-agency, and the permanent staff of employees; the purchase of machinery, materials, and the facilities of extracting the ores to advantage, would be most favourably felt in a "consolidation," while, if necessary, a smelting establishment could be supported by their combined produce alone. Again, coals could be imported from Swansea as cheaply as is now the case by smelters and merchants, who fatten on the necessities and requirements of the miners. South Crofty, East Pool, and Agar could be amalgamated with advantage to each, one executive and staff of sub-employers would suffice for the three, and no one can doubt but the interests of all would be conserved through the fusion of West Frances, South Frances, and West Basset Mines. Again, South Basset, Wheal Basset, Buller, and East Basset were formerly one set. They were divided to meet the demands of landlords, in order to secure new leases, and the present results are no profits, but, on the contrary, heavy losses to shareholders. There are four distinct establishments and employees to maintain, and conflicting interests to be combated with. Why should such distrust of each other exist and so little conservatism be manifested in Cornish mining when compared with every other branch of home industry and enterprise? Combination, not division, is the true rule for a commonwealth; a house divided against itself cannot stand; and he who aims to set one class in opposition to another can only be regarded as a common enemy. Masters may be too arbitrary, while labourers may in instances prove themselves too exacting; still, in general capital and labour can, through their own representatives, amicably settle their affairs without the intrusion of professional agitators. The latter find their occupation and remuneration out of the misery of others, while disturbances and confusion constitute the elements of their existence. It is true that there is great philosophy in opposition, and legitimate agitation is not only justifiable but most commendable whenever necessary for the destruction of monopolies, iniquitous imposts and taxes, with other oppressive burdens levied on the necessaries of life—*i.e.*, the requirements of both material and social existence. But the

labour market in Cornwall has wholly outstripped the gains acquired by the enterprising, when regard is paid to the capital embarked in mining pursuits, while the prices of fuel, materials, and machinery are high beyond comparison with former years, and contrast most unfavourable with the market prices of tin and copper. Again, the landowners show no disposition to lessen the heavy dues exacted, and the smelters regulate the value of the produce with the ease and facilities of ancient and long preserved monopolies, and to all intents and purposes regard the trade in ores as their especial prerogative, while the proprietors of mines have no alternative but to submit to their caprice and avarice. If we are to have free trade in the costs of mining, why should we not have free trade in selling the produce of our mines? The vested interests of Cornwall are, doubtless, closely allied with mining enterprises, but the vested interests of non-resident shareholders are wholly allied with expenditure and dividends.

There are mines in Cornwall of unquestionable value, as for example, Lovell, that in a year has declared three dividends, returning the whole outlay with 20 per cent. bonus. Again, Trumpet at the low ruling value; St. Agnes Consols, all but neglected by market dealers, notwithstanding its brilliant prospects; Zennor Consols, a star in prospective; Margaret and Providence, two old veterans, but not yet exhausted—very many spasmodic changes, with bright glimpses in store yet for these concerns, though it must be admitted that the cream has been churned. These companies, in comparison with many others, are sound and desirable investments at existing depressed quotations.

R. TREDINNICK,
Consulting Mining Engineer.

32, Fleet-street, London, June 3.

PROGRESS OF MINING IN CARDIGANSHIRE.

SIR,—Since the opening out of the Van Mine, where discoveries have been made unequalled, I may venture to say, by any lead mine in Europe, an impulse has been given to the district generally, stretching eastward as far as the Shropshire mines, and westward to all the mines in this county. I will not now dwell on, or rather go into, particulars of the mines in the Shropshire district, such as Tankerville and the Roman Gravels, which have opened out so splendidly, and the younger ones now opening out with, I may say, a certainty of becoming profitable, such as South Roman Gravels, West Tankerville, South Tankerville, and Ladywell, which are now saleable at many hundreds of thousands of pounds, and affording an enormous supply of lead annually, which not only does an immense good to the district but to the kingdom. Again, in the district of the Van the neighbouring mine, the Van Consols, stands prominently forward, and is certain to make a great mine, whilst the numerous young mines in the district will undoubtedly, as they are opened out, prove to be very rich, and pay immense profits on the capital required to fully develope them.

In Cardiganshire the Great West Van seems to be opening out a great and extensive mine, and will undoubtedly prove a lasting dividend-paying property. The West Esgair Lle, its next neighbour to the west, is as fine a piece of mineral ground as could be selected in any county in Wales, and they are opening out on a fine course of ore, on as fine a lode as any miner would wish to see. There is no doubt of this also proving rich and lasting. Adjoining the West Esgair Lle is a beautiful piece of ground called West Bryn Glas. A company is being formed for this, and with a moderate amount of capital there is no doubt on my mind of its becoming a very profitable and lasting mine. To the west of West Bryn Glas comes in the East Llwyn Teify, where a company has been formed, and a capital subscribed sufficient to open out a very rich mine, but the money should be expended in trying the lodes in depth, and should not be thrown away at shallow depths, where no discovery is likely to be made. West of East Llwyn Teify is the Llwyn Teify Mine, hitherto worked by a few private persons on the cost-book principle, but is now to be registered under limited liability. In this property one of the best discoveries—in fact, I may say the best discovery—in Cardiganshire for many years has been made, and it now only requires a sufficient field of machinery for crushing and dressing to bring this into the dividend-paying list. It is one of the most extensive grants in the county.

To the west of Llwyn Teify is the Aberystwith Mines, which are looking extremely well, and making good returns. A good discovery has recently been made in the 40 east, which is likely to prove a rich and lasting one; 50 tons of lead ore are to be sold this month. To the west of the Aberystwith mines are the old Ystymtyllen, Tyn-y-Fron Mines, once very rich, but where there is now little doing. To the west of these is the South Bwadrain Mine, where there are three fine lodes forming a junction near the surface, showing good lead and blende. This mine has hitherto been worked by private parties, but is now to be registered under limited liability, and cannot fail in opening out a most successful property. The Bwadrain adjoins the South Bwadrain, returning about 30 tons per month, which should give 1500*l.* per year profit. To the west of Bwadrain is the recently started mine of Tyllwyd, where a good course of lead ore has been met with in cutting down a shaft from surface to adit on the south lode. This work was done for the purpose of enlarging an air-shaft sunk by the old miners into an engine-shaft. This will at once lay open a large mass of ore ground. As soon, however, as the necessary machinery is erected, and the engine-shaft sunk 20 fathoms under adit, in driving west from this discovery 30 fathoms, the north and south lodes will form a junction, and I have no doubt at this point that such a body of lead ore will be laid open as has seldom been met with in the best mines of this district, and that a few months will place it amongst the dividend-paying mines of the county.

Diverging north from these mines in the productive channel of lead-bearing ground lying between Cwmystwith to the south, and Esgair-hir to the north, are two of the richest mines ever worked in this county. The Nant-y-Moch Mine has now been sunk to a depth of 30 fathoms from surface, at which depth the lode is now being cross-cut, where it is found to be nearly 40 feet wide, composed of sugary and crystallised quartz, carbonate of lime, copper, and lead ores, and carrying one of the finest flookans I have ever seen in the district. I shall be much surprised if this mine does not prove a second Van. Its indications at surface are quite as good, and from its position it should make the best of the Cardiganshire mines.

Recently a company has started the Court Grange Mines, which are only worked to a comparatively shallow depth, and 30 years ago, when I was connected with their management, we gave good profits, and there can be no question that they will pay, with proper management, a large percentage on the capital raised to explore them. There is a very fine piece of ground on the Peny-y-Cefn lode eastward, whilst the north lode remains untouched throughout the grant. This latter has been discovered at a mine called Elgar, where a rich course of silver-lead ore has been found on it, and which adjoins the Court Grange, and is to the north of them. It has been explored by means of an adit level cross-cut, which reaches the Elgar, and the Mynwydd Gordu lode, at a depth of about 18 fms. from surface, and where it has entered a vein 18 feet wide, composed of gossan, quartz, blende, and yielding 1 ton of lead ore per fathom for 6 feet wide on the south wall. In the Mynwydd Gordu grant, about 100 fms. east of the Elgar adit level end (which has been driven from 50 to 60 fms. on the course of the vein, and all the way productive), one of the finest discoveries of lead ore at surface that has been known for many years has been met with, so that taking this fact into consideration, and that it is situated to the west of the Esgair-hir Mine, where they are opening out on courses of lead ore 3 feet wide, solid, and that that lode runs to the north of them in a parallel direction, and having the great mines of East Darren, Cwm Erfin, Goginan, &c., to the south, with Bronfloyd and South Darren to the west, I have no doubt that a great, lasting, and rich mine must be opened out. The ground rises rapidly on the course of the lode, approaching Mynydd Gordu, and the adit on entering that sett will have attained a height of 40 fathoms, and, in fact, good machinery for crushing, dressing, pumping, &c., is all that is requisite to put this amongst the dividend-paying mines.

As this letter has proceeded to a greater length than I first intended, I will, if you will favour me with an insertion of this, give you, for next week's Journal, some further particulars of other young mines opening out around us, where discoveries of the greatest importance have very recently been made. A very short time ago most of the properties named lay dormant. Their market value now amounts to millions of pounds sterling, and their profits immense, and likely in five years to increase fivefold.

Goginan, Aberystwith, June 3. ABSALOM FRANCIS.

TO THE SHAREHOLDERS OF THE WEST ESGAIR-HIR MINE.

Goginan, May 12.—Agreeably with your request, I have very carefully inspected this property, which is situated to the west of Esgair-hir Mine about two miles. The Esgair-hir lode also running in a parallel direction to your main lode, about one mile north. To the south of your mine are the great silver-lead mines of East Darren, Goginan, South Darren, Cwmerfin, Bronfloyd, &c., which have produced many millions of of pounds worth of lead and silver. At the Esgair-hir Mine, the greatest and the richest discoveries made in the county during a quarter of a century have recently been laid open, the vein in several places being from 2 to 3 feet wide of solid silver-lead ore. To the west of you about three miles is the Old Allt-y-Crib, celebrated in history as having produced to the then proprietor lead and silver enough to equip a small army in defence of Charles I., and to lend that Monarch 40,000*l.*—a great sum in those days.

It will be seen from the foregoing remarks that the situation of the mine is all that can possibly be desired, and I will now describe the work done and the known lodes it contains, and their directions and positions, and from which I have no hesitation in saying that any person having the slightest knowledge pertaining to mining would at once see that the property is a most valuable one, and free from any speculative element, as the courses of ore already exist, and have only to be sufficiently developed to bring the mine into a lasting state of profits. The lodes worked on are three in number, the first of which I shall describe as the north lode, which has been opened on at surface for about 10 fms. long, the vein being about 2 ft. wide, containing a rib of ore 3 inches wide, solid. An engine-shaft has been sunk on the west or south-west of this working a depth of 5 fms., and from it a good pile of lead ore is now to be seen at surface. The direction of this vein is about 40° south of west and north of east. The middle lode is about 30 fms. to the south of these workings, and has been opened on about 5 fms. long, the vein being about 2 ft. wide, containing a rib of lead ore about 3 inches wide, solid. The direction of this vein is 30° north of east and 30° south of west.

The south lode has been worked by means of an adit level, driven in by the side of the river forming your southern boundary. This lode is 3 feet wide, and was missed by the old workers, being left to stand to the north of the level. This vein is one of the very finest description to be met with in this county; it contains gossan, sugary and crystalised spar, and is worth for lead ore fully 1 ton per fm. In extending this level to the eastward backs will be gained of 90 fms. Its direction is east and west, and in the latter direction the whole of the veins form a junction in your grant. And not only is this the case, but they will also, from their underlay, fall into your main or south lode in depth, and these lodes can be tried at a small cost at any time and at any place you may think desirable, by driving a short cross-cut north from your adit to be driven on the south lode. There is an abundant supply of water that can be made available running through your grant, sufficient for all purposes in all seasons of the year, a good road up to the mine, and a moderate royalty—1-14th—held by a tack-note for 12 months, promising lease for 21 years, at the expiration of which the landowner promises to make it 42 years if required to do so;—2000*l.* for machinery and dressing apparatus, and 2000*l.* more for fully developing the mine whilst this is being carried forward, will open a property capable of returning 4000*l.* per year profit to the shareholders. The carriage to railway station is only six miles.—ABSALOM FRANCIS.

METALLIFEROUS MINES (WALES).

SIR,—The tendency of the present movements in the labour market, coupled with the high prices of coal and iron, is, I fear, in Wales at any rate (I speak from personal knowledge), to shut up many mines, and generally to smother mining enterprise altogether. Owing to the tempting offers for labour made by the colliery owners, numbers of men are daily leaving the metalliferous mines for the South, and it is only by increasing wages that men can be induced to stay at all. This is in some measure compensated for by the present price of lead. But will this last? It is notorious that, notwithstanding this, many mines have been obliged to stop, and, notwithstanding, the scarcity of labour continues. If our best men are to be taken from us, it behoves us to seek to supply them, or we shall be wholly in the power of those who remain. Nor are these the only difficulties metalliferous miners have to contend with. It has become almost impossible to induce the public to come forward with capital, and this is, I think, due primarily to the reckless and, I think I may add, unprincipled way in which new undertakings, saddled with large capitals, and often, at the same time, intrinsically worthless, are brought before them. If an old mine, previously worked by private proprietors, is worked out it is immediately started as a "company." If a stone of ore is dug out at surface the sett is obtained, and it is started as a "company;" or, if a mine has a really promising discovery, every piece of land *all round* is taken up, as if lodes run like the spokes of a wheel, and they are shortly so many "companies;" and *then* the purchase money is beyond all proportion to the value, even supposing all that is promised turns out to be true. Before I go any further, let it be distinctly understood that I am not alluding to any mine in particular. Have the public any idea of what the first cost of these "setts" is, or the *modus operandi* of obtaining them? The lord who grants them gets nothing, except his royalty; the first grantee little or nothing; the discoverer, if there is a discovery, little or nothing. Where, then, does the money go? *Who gets it?* The only answer I can obtain is, the gentlemen in London. Who these insatiable monsters are no one knows, or cares to tell; we know who feeds them. They stand between the public on the one hand and the practical miner on the other, to the ruin of both. They have neither the technical knowledge of the one nor the capital of the other, and yet they prevent the lucrative employment of either. These, Sir, are but a few of the almost insurmountable obstacles to honest and lucrative mining in Wales. Need I add that as to reports they are in the main utterly unreliable. There are honest, and, at the same time, competent men, but they are the exception. It is easy to write a report which, without being untruthful, is yet not the *whole* truth.

Some steps ought to be taken if it is desired to prevent the complete frustation of mining in this district, in which I include Cardiganshire, Montgomeryshire, Flintshire, and Denbighshire. I would suggest a meeting of mining proprietors and others interested in mining in conference, in (say) Aberystwith, which is a convenient, and at this time of the year pleasant, place, for the purpose of forming an association for the protection and encouragement of metalliferous mining in Wales, and at the same time of affording, if possible, some protection to the public against worthless undertakings.

—— PLAIN MATTERS OF FACT.

NEW DOLCOATH MINE—STEAM-HAMMER STAMPS.

SIR,—I wish to pass over as tenderly as possible all Mr. Ennor's incoherent remarks and personal allusions, and to confine myself, as closely as I can, to business matters. This course I hope Mr. Ennor himself will, in future, see the prudence of following.

Messrs. Donald and Atkey, for whom I am acting, are making the most persevering and determined efforts to introduce steam-hammer stamps in Cornwall, and that those efforts are on the point of being crowned with success we, who are behind the scenes, and know perfectly well what we are about, know full well, otherwise we should have abandoned the scheme long since. On the other hand, Mr. Ennor, brimful of "practical" knowledge, up to all the secrets of "Nature's laws," and knowing more of every subject in the universe than anybody else, tries his hand at an improved stamping machine, and—fails miserably. Finding that his old friend Nature has not gifted him with the power of effecting anything good, he tries what he can do in the shape of mischief and obstruction (which is certainly more in his line), by endeavouring to write down and put a stop to the efforts of others to effect an object in which he has himself failed utterly.

It needs but a glance at the correspondence to form an estimate of the value of Mr. Ennor's opinions and statements; to show how completely ignorant he is of the very rudiments of mechanical knowledge; how funnily his statements contradict each other, the most amusing contradictions often occurring in the one sentence; how he pretends to describe a thing which he admits in another part of his letters he did not even see; how he makes the most positive statements about our machine, on the mere authority of "a man;" how he describes our piston as a moving one (whereas it is in reality fixed), describes the stamp-head as attached to the piston (which would be placing it *inside the steam-cylinder*), and describes the boiler as being capable of driving an engine with a cylinder as big as itself; and how he now meets my denial of these statements by "begging to tell me" that he holds a letter from—"a person!" The mischief *intended* by such statements as these is, however, counteracted by the amusing absurdity and extravagance of them.

As I stated in a former letter, we were so pinched for room in the tin-yard where the machine is placed that we had to make shift as well as we could under very awkward circumstances. We had to place the boiler at first just where we could find room for it, which happened to be in a position a little higher than the cylinder, thereby causing it to "prime" (which Mr. E. calls "drowning the cylinder"); so that the feed-pump could not make head against the waste of water by priming. In order to get the boiler lower we had to break into a large round buddle, which we were at first unwilling to do, until we had made the preliminary test. This effectually stopped the priming, and stamping was then done regularly during the daytime. The results were sufficiently satisfactory to warrant us in making a permanent alteration in the laying out of the floors to suit the requirements of the machine; and instead of the portable boiler, which was good enough for the preliminary test, to put down a stationary boiler, big enough to work as many additional machines as we could find room for on the ground. We, therefore, put down what Mr. Ennor calls a "great boiler"—that is to say, a *four-ton* boiler. This is a simple statement of the facts about the boiler, and I can only characterise Mr. Ennor's statements as mischievous falsehoods, for an obvious purpose; he having nothing whatever to put forward in support of his statements but what he alleges to have been told him by "a man," written to him by "a person," and seen by himself in the dark! This is the sort of evidence on the strength of which he disputes and challenges the accuracy of the information possessed by those actually engaged in carrying out the work.

I never saw any report in the public papers that the machine "burned more coal than was required to work a 60-inch engine," nor do I believe that anything of the sort was published in any paper until Mr. Ennor put forward his absurd opinion that our 4-ton boiler would drive a 60-in. engine. If there is a word of truth in his statement Mr. Ennor will give the names and dates of the papers he refers to. I have only further to add, that for a long time the machine was not under cover of any sort, and we were continually pestered by a number of idlers and quidnuncs coming about the machine, after Mr. Ennor's fashion, and pulling at the handles, &c. In consequence of this, and a good deal of rough usage and exposure, some parts of the valves, &c., got injured, and the machine has been working for some time with the valves in this condition. We have, therefore, taken the injured part to Bolton to be renewed, and we hope to have all going again as soon as possible after the Whitsuntide holidays. It is scarcely necessary for me to ask your readers to suspend their judgment on the machine until further trials have been made, for Mr. Ennor has made such an exhibition of himself as would scarcely incline people to trouble themselves about what he thinks or writes. When we give the thing up the public may set it down as a failure, but not till then.

J. STURGEON.

Bolton, June 4.

MR. N. ENNOR, AND TIN DRESSING.

SIR,—Would it not have been more satisfactory on Mr. Ennor's part if he had examined for himself before making his rash assertions? It seems he admits having valued the sea beach below the Red River without having seen it. I would ask if his valuation of leavings at Drakewalls is arrived at with similar care? I do not perceive that he has yet named the mine where he informs us that they raised and sold 100,000*l.* of tin while working, and sold a similar amount from the leavings after the mine stopped. Should this mine not be named soon some people may, perhaps, be unbelievers enough to doubt it altogether. Mr. Ennor informs the public of tin being going down from Pedn-an-drea as though it was dirt, and in the same paragraph admits that he does not know the valley where all this is carried on. We are also informed that the tin waste first goes down an adit shaft at Sparnon, which is another of Mr. Ennor's so-called facts, existing only in his too imaginative brain. As Mr. Ennor sets himself up as a teacher of young aspirants, may it be asked if this is the kind of teaching he thinks necessary to afford the mining youth? It strikes me that the art of making assertions without examination is not a very necessary qualification, nor is it very desirable in young miners. If Mr. Ennor will confine himself to truth his censorship may become beneficial; but false accusation and abuse are beneficial to no one.

June 5. W. TREGAY.

MR. ENNOR ON NATURAL LAWS.

SIR,—One of your readers has asked Mr. Ennor, the great mining instructor, to explain to him "the laws of Nature," concerning which he appears, or would appear, to be so very conversant. If Mr. Ennor will condescend to satisfy that enquirer, I should be glad to have information also as to the "freaks of Nature" spoken of or adverted to by Mr. Ennor. These "freaks," I suppose, are exceptions from the general laws; then, if so, what reliance can be placed on the "laws?" A man may determine to take a course of action according to the laws as assumed by Mr. Ennor, but Nature may take a "freak" and baffle his plan and hopes. If Mr. Ennor can inform the miners first the "laws," and when and under what circumstances "freaks" may be expected, he will confer a favour. But the word "freak" means a "sudden fancy, a whim, a capricious prank;" then how can any reliance be placed on "laws" so variable as a whimsical man? I think that Mr. Ennor will find it a difficult matter to state either the "laws" or the "freaks," although we must admit that there are laws by which the geological and mineralogical processes are conducted in the earth.—*June 5.* —— R. S.

RESOURCES OF NEWFOUNDLAND.

The following letter has been addressed to the Editor of the *Times*:—

SIR,—In your issue of Tuesday you mention the fact that Mr. Bennett, the Prime Minister of Newfoundland, is working a most profitable mine of copper and nickel in that island. May I be permitted to state that he is not the only person at present concerned in developing the resources of the country? The company to which I am attached holds the lease of a most valuable lead mine at La Manche, on Placenta Bay, about 70 miles from St. John's.

From information which I have received in my capacity as secretary to this company, I can corroborate all your correspondent's remarks as to the vast, but hitherto undeveloped, riches of the colony; and I thoroughly believe that few, if any, of our possessions offer so favourable a field for enterprise as Newfoundland.

The interior of the country abounds in the most valuable timber; the coasts and rivers swarm with fish; the climate, owing to the incidence of the seaboard of the Gulf Stream, is many degrees warmer than that of the neigbbouring continent; the harbours are safe, deep, and spacious, and mines of copper, lead, nickel, and coal are known to exist. Marble of the purest quality has also been discovered, and if, has as been suggested, a railway be constructed across the island in connection with the Intercolonial Railway, with a fleet of steamers from Queenstown, the mails to New York will be accellerated at least two days.

N. M. BYERS.

Newfoundland Mining Company (Limited), New Broad-street, June 3.

THE NEW QUEBRADA COMPANY.

SIR,—As a shareholder in the New Quebrada Company, I am extremely sorry to observe the various letters which from time to time have appeared in many numbers of the *Mining Journal*, crying down the prospects of the company, and advising shareholders to get rid of their holdings with all possible speed.

It requires very little penetration to discover the drift of these writers; they are interested "bears," who having decided—for reasons best known to themselves—that the mine is of no value have sold at the present price, with the determination to smash the concern, if possible, by continued bad reports, in order that they may be able to buy back at the low figure to which they hope to see them fall.

Now, if these depreciators had any right on their side I would not say a word against them; but they know as well as I do the present position of the company; they know that the undertaking never had a better prospect of success than it has now. The Bolivar Railway, floated by a number of gentlemen of the first standing, has already sent out men and materials for the construction of the line which is to bring the enormous wealth of these rich mines to the coast. I am told by those intimately acquainted with the company that the railway is fully expected to be completed by this time next year, and when once the line of communication is thoroughly established the long-expectant New Quebrada shareholders—at least, those of them who have not been induced by enterprising "bears" to sell

their holdings—will at length see their shares at a figure which even the most sanguine could never have anticipated. All those who have visited the mines concur in saying that they are the richest, without exception, in the world, and the only thing necessary to bring their wealth to us is a railway.

My advice to fellow-shareholders is to retain their shares, to have patience for a few months longer, and then they will reap the reward which is their due. —— A LOVER OF FAIR-PLAY.

THE MOTHER LODE GOLD MINES, AMADOR COUNTY, CALIFORNIA.

SIR,—The San Francisco *Daily Chronicle* recently sent a Special Reporter to examine the famous gold mines of Amador County, California, and to prepare a report of their condition, to be published in the pages of that Journal. This report was published in two recent numbers of the *Daily Chronicle*, and among other things the following statements appear:—

"And so we hurry on to Amador County, where we expect to see mines that rank among the richest in the world. The Amador County ledge (the Mother Lode) is inclined to be very wide, all the rock from the mine pays, and but little waste comes to the surface. In this county is located the biggest gold quartz mine in the State, the Big Amador (Hayward-Amador) and others, which have yielded large profits, an I expect to for many years to come."

THE PHŒNIX MINE.—The Phœnix Mine was formerly called the Plymouth. A new company has recently purchased it. Two shafts are down 220 and 600 feet respectively. A new 40-stamp mill has been recently erected, and is now successfully running on good ore, and the company propose within a short time to erect 20 additional stamps. The lode here (Mother Lode) is 30 feet wide. How the Grass Valley mines pale before this immense body of ore!

THE BUNKER HILL MINE.—The Bunker Hill Mine is located within half-a-mile of Amador City. The Bunker Hill Mine's prospects may be set down as A No. 1. An examination of the rock hauled from the mine to the mill shows that they now have a valuable ledge. The character of the rock is excellent. When we passed the mill had suspended operations (for a day or so) to enable the superintendent to clean up the gold, and the looks of the plates justified us in the belief that the clean up would be satisfactory to all concerned. The owners of the Bunker Hill have every possible indication of the possession of a good mine.

THE KEYSTONE MINE.—This mine has a reputation second only to the Big Amador (Hayward-Amador) in the district. Everybody has heard of the Keystone Mine, and many a mouth has watered to finger some of the dividends which, with the regularity of clockwork, have been paid to the shareholders for eight years past. The Key-tone is a big mine in every sense of the word; such a mine as makes a man feel well disposed to all the other mines of the State. The mine yielded well up to 1865, and in that year was bought by a party of capitalists, and since then has paid back its cost eight times to the purchasers in dividends. The galleries, drifts, winzes, &c., are numerous, and passing through them the visitor sees whence have come the clockwork dividends paid monthly to its stockholders. The average width of the ledge is 10 to 15 ft.; average yield of rock, $16 per ton; and product, $30,000 to $40,000 per month. The mine has a first-class 40-stamp mill.

THE HAYWARD-AMADOR MINE.—This mine yielded over $4,000,000 prior to 1858, and in that year was bought by a party of capitalists; since this purchase it has yielded over $6,000,000 more. We descended with Superintendent Steinberger into the mine over 1500 feet. The cost of mining and milling does not exceed $4 per ton; hence, if the entire mass of ore only averages $10 to $12 per ton the profit is large enough to satisfy the cravings of any ordinary financial appetite. There are three shafts in the mine—the Badger, Middle, and North shafts. To work the ore there are three mills, aggregating 72 stamps, one having 40 stamps, the other two 16 respectively. The latter can be run by water power as well as the former, but the former can be run by steam when water is scarce. The company pays regular monthly dividends, never less than $30,000, after placing a very respectable sum in the treasury for contingencies and construction account.

The company contemplates the erection of a new 60-stamp mill when the Sutter Canal is completed, there being plenty of ore to feed such a monster. The ore increases in quantity and quality as they descend upon the vein. The big ledge has a stope of 1400 ft., with 300,000 tons of ore in sight. When Macaulay's Traveller from distant climes shall stand upon the cylinder of one of the Hayward-Amador's engines, and gaze down into the shafts, he will be lost in amazement at the work done, and the amount of gold extracted from the depths below.

ANGLO-AMERICAN.

THE EMMA SILVER MINING COMPANY.

SIR,—I notice that some shareholders are likely to make a searching investigation into the affairs of the company. This looks like shutting the door after the horse is gone. If the shareholders had investigated the affairs previous to laying out their cash they would have found out that the Emma Mine was almost cleared out, and that when the rich deposit was done with, in a shaft immediately under this deposit only strings of ore were met with. As to levels and other ramification of mining they did not exist; that the ore outside of the mine was the dump or refuse, which would not pay to ship (60,000*l.*, I believe, was paid for this); that no machinery was in or on the mine, except a whim drawn by a mule; that the main tunnel, or only entrance to the mine, was guarded night and day by men armed with Martin-Henry rifles and Colt's revolvers; that no ore could be shipped from the mine during the winter months; and, finally, that without a new discovery the Emma would soon be a "skat" bal.

I was employed at the Emma Mine some time, and whilst there have seen mining experts take samples of loose ore from the walls, the superintendent pointing around, explaining that it was all ore, at the same time it was solid limestone rock, and measurements were made in the same way. I left the Emma in August, 1871, and it has been amusing to me, as a practical miner, to notice since then the various reports made on this property, and the easy manner English capitalists were led to expend their cash on Yankee swindles, whereas if only one-third of the money were expended on legitimate Cornish mines this county would now be in a flourishing state, and our young men kept at home instead of following the money sent from London to foreign countries. W. EDDY, jun.

Pendeen, Cornwall, June 2. ——

THE EMMA MINE, AND THE RECENT SPECIAL MEETING OF SHAREHOLDERS.

SIR,—I have perused your report of the special meeting, held last week, and I am fairly astounded at the resolution passed thereat. In the first place, it is clearly illegal, and in direct contravention of our Articles of Association, which form the governing rules of our company; and, in the second place, were it legal, it is utterly inequitable, and much do I regret that a still more one-sided, although probably a very diplomatic, suggestion should have emanated from our Chairman.

Why should I, holding a large number of shares for five months, be excluded from a conference with the directors upon the position and prospects of the company, when another shareholder, holding it may be five shares, should be empowered to form part of the conference, not because he is the better able than I to discuss the knotty points at issue, nor because he would be likely to be less violent against the directors for their now evident *laches*, but because this less interested proprietor, from the merest accident, happened to be registered four weeks earlier than myself? I say it advisedly, that this is one of the most violent contortions of the Companies Act, in which all shareholders are partners, that has ever defaced a joint-stock enterprise.

Our Chairman's plea is that such a conference will be more manageable than a general meeting. Is this a sufficient plea for a positively illegal act and an outrage on common justice? Our Chairman cooly told us—at least so says your report—that the report of the last meeting did a considerable amount of mischief, and therefore proposed that the original shareholders should confer with the board—a conference at which reporters would not be admitted. What does this mean? Either that there is much yet to be divulged which it would be inconvenient to those who are not original shareholders to know, or that some sort of compromise is contemplated, in which only original shareholders are likely to participate. Can it it be possible that Mr. Park has empowered our Chairman to "propose terms" to the originals, who did not follow Mr. Park's example by selling their shares at a premium, but sanguinely credited Mr. Park's statements? Even if this be the case, and admitting that those, like myself, who required an interest other than as allottees, have no right to a participation in the division of conscience-money, the illegal resolution of last week remains.

I can easily point to cases of allottees having reduced their interest to the lowest number of shares, and, of course, largely profitted by the operation at the expense of many, including, perhaps, some of those who have not been "shareholders for the last six months past," and yet these gentlemen, who, taking time by the forelock, sold down their holding to such small proportions below which, for appearance sake, it would not have been respectable to go, are to be admitted to confer and recommend as to the future of the affairs of the company, out of which I have not gained a profit, but sustained a serious loss, while I am excluded. Where is our solicitor's knowledge of the Companies Act and of the Articles regulating the affairs of our company?

As one of the many shareholders who have not held any shares for "the last six months past," I take this opportunity of emphatically protesting against such an unjust and illegal procedure.

June 3. A HOLDER OF ABOUT TWO HUNDRED SHARES.

SKETCHES OF BROKERS—No. I.

SIR,—The "profession" of mining brokers is of modern origin. Forty years ago there was, I believe, only one in London—Mr. Bawden, who died a few years since at an advanced age, and was a man distinguished for honourable dealing. The next broker that I heard of settling in London was Mr. W. Trenerry, of Redruth. He went up about 40 years ago, and opened an office at 9, St. Michael's alley, Cornhill: that is where I found him in the year 1847. His success was rapid—dealing on commission. I was informed that his "clients" were very numerous, and crowding his office for hours every day. There was neither necessity nor opportunity for going out to seek for business like some brokers do now; he was oppressed by business within. He had several clerks from time to time, all of whom, I believe, afterwards opened offices as brokers, and some of them are now alive. At that period there was greater innocency in the transactions of brokers than there is now; science and art were not so far advanced then. Mr. Trenerry saved money, and invested some of it in houses, which yielded a good income. But his career came almost suddenly to a termination, from the following circumstance:—He had sold some shares in a Welsh lead mine which did not yield ore as it was represented it would, and a purchaser commenced an action in law or equity against him for restitution. Whether the purchaser could have recovered or not by legal or equitable proceedings I cannot judge, but Mr. Trenerry, actuated by disgust, fear, or otherwise, sold off his property, and has ever since lived in France, in the enjoyment of the fruits of his labour. It was about the year 1852 that he left England. By that date the number of brokers had increased to about 20 or 30, and now they number more, perhaps, than 50.

Mine broking, conducted in an honourable way, is a very useful "institution," if I may so term it, because a man who wants either to buy or sell can through a broker quickly effect his wishes; but, like many other good institutions, abuses have crept in. A great number of the mines in Cornwall, Devon, Wales, and elsewhere were started by brokers, some of which have proved very valuable, but many of them, for want of capital, &c., have been only started. R. SYMONS.

Truro, June 4.

"JAPHET," AND HIS DETRACTORS.

SIR,—It is very generous on the part of "Spectator" to come to the rescue of "Japhet's" reputation. Doubtless, I am regarded as one of the "detractors," because I have considered it right in the public interest to call attention to the exorbitant prices charged for Terras shares—*unnatural* prices they were. I take leave to question the equity of issuing puffing "Circulars," whereby the prices were made to range, as I said, beyond a fair limit, and which were not warranted by any discoveries made. Purchasers were wrongly advised. I am not aware that I ever said or wrote that the shares were worth more than par. At that price I believe "Japhet" purchased them, or at 15s. each. I consider Terras now a fair field for speculation—in operating on the *lodes*, which are said to be *numerous*. If the money paid "Japhet" had been applied to exploratory *works*, perhaps the operations would have been continued with more regularity and success. I am of opinion that the "collapse" *was* hastened by the high prices paid for the shares—exhausting, probably, both the means and good temper of the investors. I am not conscious of having recommended capitalists to purchase at any price beyond par, if at all. I do not envy any man, and I do not feel "malevolent" against "Japhet." But "the author of an advertisement is never more contemptible than when pretending to advise capitalists for their good aims only at enriching himself at their expense." Your correspondents may write as much as they please in justification of the course pursued by "Japhet;" they will never, however, convince the public that it was a fair way of getting money. He appears to have borne in mind the old adage attributed (wrongfully, no doubt) to a Quaker—"Get money, honestly if you can, *but* get money." "Spectator" may be assured that I am not the *representative* of any unfortunate investor. It would be well in people who are so sensitive to their own reputation to show a little respect for that of others, and not write untruths. "Those who live in glass houses should not throw stones" is an old saying.—*Truro, June 4.* R. SYMONS.

"A WORD OF ADVICE."

SIR,—I had no time last week to echo a response to your correspondent at Gunnislake, and his "Word of Advice." "Echo" would have acted far more manly had he signed his real name and address, and had first paid Wheal Barnard Mine a visit, then given an open and candid opinion or criticism of what he saw, exposing in an honourable manner its effects and defects. In these days of mining depression it is almost ludicrous to hear one mining man railing against another, and most assuredly there is no occasion to point out my shortcomings in the past—they are only too well stamped upon my own memory. The trio of mines with which my name has been connected have had, at least, some opportunity to display their worth—as, after all, the minerals sold have been very far beyond the average of the county; the Virtuous Lady, even with all its faults, one month realised 750*l.* for 100 tons of copper ore. Compare this with last month's ticketings. Again, the old Queen sold 2000 ozs. of silver to Venables and Co., of the Royal Exchange, independent of 1500*l.* worth to the smelters, and returns of arsenic, copper, and tin.

I still repeat, and with stronger emphasis than ever, that the Virtuous Lady teems with wealth, but it cannot be secured by the old style of working; searching for copper ore, which, at the best, when happily secured, will, at the present low price of the article, barely pay for the search. There are hundreds of thousands of tons of stuff in the mine that will give 7 ozs. of silver per ton. It is simple enough to calculate the value, and all that remains to be done is to extract the silver at a profit on a large scale. It is strange, but none the less true, that for the past two years the most noted and practical men have heralded forth the rich value of tin mines upon the strength of 14 lbs. to 20 lbs. of tin to the ton of stuff. Now, everyone who has seen a tin mine really at work can speak of the one hundred and one processes to make the material merchantable; in fact, it is far more tedious and expensive than extracting silver, and 7 ozs. of silver are of as much value as 50 lbs. of tin—of course, the precious metal must exist before it can be secured. Several clever wags have often hinted that I could take silver out of a brass button. Not so; but a far more easy task than finding a merchantable and paying mine, after the order of the old style of mining, is the converting of a brass button into silver. This can be seen any day at Wheal Barnard; but the silver must be in the stuff, and ultimately in the liquor, before the button, shank and all, can be dissolved and take its place. But why croak? The time to be up and stirring is when things are at the worst, and, depend upon it, there are ways and means of good coming out of this present evil. Mining should give a certainty of 5 per cent. per annum interest, and a prospect of 5*o* per cent. This can be done by putting the shoulder to the wheel, and I feel confident that the silver question will cause many a property to be worked at a profit, when hitherto they have been conducted upon heavy losses; at all events, this is no mere chimera of the brain, as the actual results can be seen at Wheal Barnard, from the removing of the burrows to the stamps, down to the refining of the silver. THOS. J. BARNARD.

4, *Abbey Mount, Tavistock, June 4.* ——

WHEAL BARNARD.

SIR,—I have lately paid this mine a visit, and am pleased to find that Mr. Barnard has, at last, carried his promises into action. He is certainly extracting, as he says, silver from the waste rubbish heaps, but can he do it to a profit? I wish him every success, and would advise every practical miner to give him and his mine, and lixiviating works, as he calls them, a look up; and an open discussion upon the matter, in my mind, would be of greater advantage to mining in its present dull tone than the personalities evinced in the correspondence sheet which has appeared in your columns the past few weeks. If silver does really exist in old burrows, and can be worked to a profit, I should say let some scientific men take the subject in hand, and either prove him right, and give him a helping hand, or if radically wrong silence him for ever. Surely there are men to be found, practical and scientific men, who will come forward and openly inform capitalists if the thing is to be or not to be a success. He must be certainly again finding capital to prove his schemes, and if as regards profits they are wild vagaries it would be mercy to capitalists for some one to give him his quietus.—*June 3.* FAIR-PLAY.

[For remainder of Original Correspondence see to-day's Journal.]

VENTILATING MINES.—Mr. R. S. TAYLOR, of Longdon Mills, near Wellington, has patented some improvements in machinery or apparatus for ventilating coal and other mines. According to this invention a vertical flue or channel in the mine shaft is connected on the face of the earth with the exhaust side of the drum or cover of a rotating fan, the bottom of the vertical flue or channel being connected with branch pipes, which extend to the upper and lower portions of the workings. To these branch pipes small supplementary pipes, provided with valves or stop-cocks, are connected, which last-mentioned pipes ramify into all the principal upper and lower portions of the workings. By means of the valves or stop-cocks any portion or portions of the workings can at pleasure be put into communication with the flue or channel in the mine shaft, and by the exhaust action of the fan the foul air may be rapidly removed, fresh air entering the mine by the shaft or by a second flue or channel in the shaft. The mine is thereby effectually ventilated, and the danger of explosion from fire-damp and suffocation from choke-damp is thereby obviated.

STEAM BOILER FURNACES.—Mr. E. ENSOR, of the Pool Works, Woodville, Leicester, fire-brick manufacturer, has patented some improvements in steam-boilers and other furnaces, and in the means for supplying the same with fuel. This invention relates to an improved construction and arrangement of steam-boiler and other furnaces, and the flues in connection therewith. Also in the means of supplying such furnaces with fuel, whereby considerable economy in the consumption of fuel is effected. According to one mode of carrying out my invention, I construct the furnace with horizontal or nearly horizontal fire-bars, and close up the front thereof where the fire-door usually exists. Within and across the chamber of the furnace I construct a number of shelves of different elevations, and at convenient intervals, and immediately above each shelf I form an opening in the roof. The several openings converging towards an opening into the bottom of a semi-cylindrical trough of metal, built in the brickwork of the roof of the furnace. Within this trough there is fitted to revolve by any convenient or well-known arrangement of mechanism, a cylindrical vessel having projecting ribs at intervals upon its exterior surface, which scrape over the interior of the trough as they revolve. The cylindrical vessel is kept supplied by hand labour, or otherwise, with small coal or slack, and one or more openings are made in the side of the cylindrical vessel, through which, as the vessel revolves, a portion of the small coal escapes into the trough, which coal is discharged down the several feed openings in the bottom of the trough by the projecting ribs on the cylindrical vessel as it revolves. The coal thus supplied is partly caught upon the shelves in the furnace and is there consumed, and partly falls on to the grate bars. Underneath, and partly up the sides of the boiler, which is of the ordinary egg ended form, there are constructed a number of narrow flues of fire-brick, disposed in rows, and in two or more tiers, such tiers corresponding, or nearly so, in height with the shelves in the furnace, so as to be opposite to the burning fuel contained thereon. The several flues run parallel to one another throughout the entire length of the boiler, and thus subdivide the flames and current of heated gases into a number of parallel streams, each one of which transmits its heat to the fire-brick sides of the flues. These fire-brick flues, as well as the entire surface of the boiler itself, are enclosed by an outer wall of ordinary brickwork to prevent loss of heat by radiation, the said flues becoming highly heated, and giving off their heat to the generator. Between the top of the generator and the fire-brick covering thereof, a flue space is left for the circulation of the products of combustion over the boiler on their way to the chimney. Two steam domes are constructed on the top of the boiler, which project up through the brick covering, and serve for the attachment of the safety-valve, and other usual steam-boiler appliances. Should the water level of the boiler be below the top of the boiler, the top flue will serve for super-heating the steam in the upper part of the generator. According to another modification of furnace the shelves may be dispensed with, and the fire bars be inclined downwards towards the inner end, so as to bring the mass of burning fuel well in front of the series of fire-brick flues. These flues, moreover, may be disposed in concentric segments of circles round the bottom of the boiler, being built of segmental shaped fire-brick lumps, having projections thereon, so that when built up together a number of intervening channels or narrow flues will be formed, which may or may not communicate by cross passages, as found desirable.

FOREIGN MINING AND METALLURGY.

There is nothing very new to report with respect to the French coal trade. Everyone maintains an attitude of such reserve that there are neither many offers nor many serious demands, so that prices remain nominally unchanged. Coalowners will not make concessions, and, on the other hand, metallurgical industry cannot be carried on at a loss, so that production is restricted, and orders are reduced. Coke exhibits a decided fall, but it is contended that it was unnaturally high before, and that its price may now very fairly be reduced without bringing down other articles with it. There is some truth in this.

The intelligence received from the German coal basins of the Ruhr and Saarbruck is favourable—at any rate, from a coalowners' point of view. As regards the first of these two basins, the orders received from Belgium have considerably contributed to the firm maintenance of prices. The same influence makes itself felt, although less sharply, in the Saarbruck basin. There are said to be some large contracts in course of execution. Messrs. Schmidborn and Ruchling Brothers transmit a circular of May 26, in which they announce a notable advance in freights. The production of the Royal Saarbruck Mines in the first quarter of this year was 1,063,727 tons, as compared with 987,645 tons in the corresponding period of 1872. A rather sensible increase has thus been established in the production this year.

A slight improvement which had been noticed in the French iron trade has not been maintained; the cause is attributed to the political crisis through which France has been passing, and it is probable that the uncertainties and the depression which resulted—at any rate, at first—from the fall of M. Thiers, have had something to do with the unfavourable tone of the market. A fall in prices would be especially onerous and discouraging just at present, since coal maintains its price; it will readily be understood, then, that many industrials regret the concessions which they have already made, and that they do not willingly enter upon fresh transactions. Under all the circumstances, it is not surprising that there should have been little doing. The forgemasters of Champagne have determined to reduce their production rather than to lower their prices, which remain nominally at the point at which they stood a week previously. First-class merchants' iron is dealt in at between 12*l.* and 12*l.* 12s. per ton; the last-named quotation is, however, to a great extent fictitious. Refining pig, charcoal made, ranges between 7*l.* and 7*l.* 4s. per ton. In the Nord, whatever may be said to the contrary, prices exhibit feebleness, notwithstanding the ardour displayed by certain ironmasters in defending quotations. Merchants' iron is dealt in at 11*l.* 4s. per ton; some small quantities have, however, changed hands at 12*l.* and even 12*l.* 8s. per ton. Upon the whole, the consumption of iron must have rather materially diminished in France, since the successive reductions made in the production during the last few weeks have not exerted at present any influence upon prices. The Alais Forges and Foundries Company is paying a dividend for 1872 at the rate of 1*l.* 8s. per share.

It is remarked that not only are adjudications of rails now taking place at lower rates in Belgium, but that English firms are beginning to tread closely upon the heels of Belgian in the prices at which they submit tenders. Nevertheless, the nominal quotation for merchants' iron in Belgium has been carried to 12*l.* per ton, although it would be very difficult to say that transactions are concluded at that price. Buyers appear disposed to contend that they can effect purchases at much cheaper rates, while, on the other hand, producers seem little inclined to sell at fresh reductions, and have accordingly carried the price of merchants' iron to 12*l.* per ton. High rates are current for pig, but only indispensable purchases are made, and it is difficult to give an average quotation from the small contracts concluded. The rolling-mills still want work, and, upon the whole, Belgian metallurgical industry does not appear to be doing very well; the sky so long bright and blue seems to be covered over with some clouds. Will it again become unclouded? Whatever some people may think, it is a fact that new metallurgical enterprises are being developed in Belgium. Thus, the Monceaux works have been purchased by the Bank of Belgium, and the blast-furnace of M. Camille Mineur has just been re-lighted. Rolling apparatus for plates on the Lauth system have done extremely well at the Espérance Works in respect both to rapidity of work, quality, and polish. MM. de Wendel, of Havange, are stated to have come to terms with the inventor, and the Sclessin Works are also disposed to employ the system.

Copper has presented scarcely any variation at Paris. Chilian in bars is quoted at 91*l.*; ditto in ingots at 96*l.*; and Corocoro minerals (pure copper), at 96*l.* per ton. At Havre quotations for copper are, to a great extent, nominal. At Marseilles prices have exhibited a slightly upward tendency, and transactions have been tolerably well sustained; Spanish in plates has made 92*l.*, and small refined ingots 92*l.* per ton. In Germany the aspect of the copper trade has not improved; transactions have not been very numerous, and prices have slightly given way. At Cologne the market has been very quiet, consumers, in anticipation of a fresh decline, showing a good deal of reserve. At Rotterdam tin has been dull, although the deliveries have been very considerable; Billiton has realised 79fls. to 79½ fls.; and Banca, 80 fls. Banca has experienced a downward movement at Amsterdam; there has at the same time been some demand, and some small transactions have taken place at 80 fls. to 80¼ fls.; the closing prices have been 80 fls. to 80¼ fls. Tin has been slightly declining at Paris; Banca, delivered at Havre or Paris, has brought 145*l.*; Straits, 154*l.*; and English, delivered at Havre or Rouen, 152*l.* per ton. The German tin markets have been generally feeble. There has been a slight reaction in lead at Paris; French has brought 24*l.* 8s. per ton, delivered at Paris; English and Spanish, delivered at Havre, have realised 24*l.* 8s. per ton. The German lead markets have been firm There has been comparatively little business passing in zinc at Paris; Silesian, delivered at Havre, has brought 29*l.* per ton. In Germany zinc has attracted less attention, but prices have been firmly supported.

Only a comparatively small number of transactions in coal have been concluded in Belgium during the last few days, so that it is difficult to establish very precise quotations. Contracts concluded before the present retrograde movement set in are still for the most part in course of execution. Some pits are, at present, almost destitute of stocks, but at many others stocks begin to be formed. Coke is sensibly declining, following more closely than coal the downward movement in the iron trade. Some contracts are stated to have been concluded at 2*l.* 16s. per ton in the Mons basin, but this quotation is not now a real one, and we learn from a good source that business has been done at much lower prices. If we do not now attempt to give the actual prices it is because the quotations which have come to our knowledge are too variable to be reproduced. Advices from Liége state that in that district the coal trade exhibits a decided tendency to weakness. The offers made are in excess of the demand prevailing, and during the last fortnight the collieries have been forming small stocks. Great consumers have not yet renewed their contracts, and they would seem to be awaiting a more decided fall in prices. Formerly the coasts of the North and Baltic Seas were supplied with English coal, but this coal now arrives under difficulties, and even makes default altogether. The basin of the Ruhr is beginning to acquire a footing upon the littoral in question, and is taking the place long held by English coal. As regards the next winter, the Belgian basins may, perhaps, not have to fear so much the competition of German coal; and if the political situation—very precarious at present—does not change for the worse, a revival may again be witnessed in affairs.

The King of the Netherlands has approved the statutes of a new company formed for the establishment of a line of steamers between

the Dutch Indies and Holland. The new company is to take the name of the Java, and the capital is fixed provisionally at 100,000*l.*, with power to carry it to 600,000*l.* The office of the company is to be at Amsterdam. The Marchienne-au-Pont Forges and Rolling-Mills Company has been officially authorised in Belgium. The object of the company is to take over the works of Mr. Edward Bonchill, at Marchienne-au-Pont. Another Belgian company has been authorised under the title of the St. Hadelin Collieries Company. The company is formed to work a concession at St. Hadelin, but the company is also empowered to acquire an interest in other collieries. A Royal Belgian decree authorises the establishment of the Bonne Espérance Collieries Company, at Montigny-sur-Sambre. The property of this company comprises what formerly belonged to the old Bonne Espérance Company at Montigny, but power is taken to acquire other workings.

The Prize Essay—Practical Mining.

No. VIII.

SECOND ESSAY—PART II.

HUSBAND'S PATENT FOUR-BEAT PUMP VALVE.

These valves are so well-known that little explanation is required here; they are at work in most of the London waterworks, and numbers of large mines, &c., and giving the utmost satisfaction; they work easily and without shock or vibration, and can be applied to and fitted into the ordinary nozzles or valve boxes of pumps or steam-engines, to replace those of ordinary construction. By the use of this valve and seat a greater water or steam way is obtained than has hitherto been attained with the same lift of the valve off the seat, consequently the shock is diminished, both in closing and opening the valve, and at the same time gives greater freedom for the passage of liquid or fluid. It is almost of equal importance that the weight of this valve may, in consequence of the reduced lift, be considerably diminished with a proportional diminution of the motive power employed, and thereby in steam-engines economising fuel. The arms which unite the various valves are inclined from a vertical plane, and in such a way that the valve when rising by the action of the water, or falling through the water, shall rotate, thus ensuring an equal wear of the beats, guides, and interior of valves. The greatest proportionate lifting area is given to the upper part of the valve whenever there is sufficient height in the valve box, thus keeping the centre of gravity low down, and diminishing the tendency to cant on one side. Several of these valves have been working constantly during a period of five years without the slightest repair or attention required.

The opponents of the Cornish engine have made it a point to take objection to the liability of accident in cases of breakage of the main in pumping establishments for the supply of water to towns and cities, and breakage of pump-rods, or main rods in shafts, &c. In the former case an apparatus or safety balance valve, designed by Mr. Husband, Hayle, Cornwall, and now in use at several waterworks, has been found to keep a constant load against the engine, reducing the oscillation in the pipes, and dispenses with that costly structure, the stand pipe. In the latter case of breakage of main rods an admirable arrangement has been patented by the same gentleman—Husband's Safety Governor for Cornish pumping-engines, which is a cheap, simple, and effective arrangement, acting simultaneously with the engine; the apparatus consist of a plunger fixed in the cataract cistern, worked by a lever connected with the plug rod; if by any means the engine has a tendency to come indoors too fast, the lever forces down the plunger, thereby increasing the pressure, and raises a small ram in connection with the equilibrium catch, which immediately opens the equilibrium valve, admitting the steam under the piston, and preventing the engine coming indoors violently.

There is no complication in this arrangement, and is not likely to get out of order: being such a cheap and sure safeguard against such accidents as spoken of, I should recommend it to be applied to all Cornish pumping engines. This governor cannot well be described without the aid of drawings, therefore I beg to refer the reader to the patentee, well known in Cornwall for the many improvements he has effected in mining machinery.

BOILERS.

The best and most economical form of boiler employed for mining purposes is the cylindrical one-flued type, known as the Cornish boiler; they are usually constructed of about 6 ft. external diameter, with tube about 3 ft. 6 in. to 3 ft. 10 in.; length 30 ft., weight about 10 tons, with a heating surface of about 720 square feet. They are rarely fitted with safety feed apparatus, alarum whistles, or any of the numerous plans invented for the prevention of boiler explosions; a good attentive man supersedes them all, and these self-acting apparatus only tend to make a careful man careless and neglectful, and would, I think, in the end be conducive to more danger than safety. Although boilers can scarcely be termed "mining machinery," the duty of an engine depends in a great measure on its economical steam generating power, and I think it would well repay engineers to experiment on and investigate more thoroughly the laws of heat, the most effectual means of applying it, and the most efficient method for the prevention of loss of heat by radiation, conduction, &c. Boilers, as usually fed, are often a source of annoyance and expense, the introduction of the feed water at a lower temperature in the bottom of boiler keeps it very much cooler than at the top of boiler, consequently there is undue contraction and expansion, thereby rendering the boiler leaky, and often cracking the plates in the bottom; this may be remedied by inserting the feed through a copper pipe in the top of boiler, which branches round the centre tube, passing through the heated water in the boiler and discharges near the bottom; in this way the introduction of cold is distributed. Boilers should always be well clothed with some non-conducting substance to prevent loss of heat by radiation and all steam pipes, or reservoirs, cylinder, &c., which are too often left totally or partially clothed, should be well protected from the contact of the surrounding air. It is utter folly to expend coals (and consequently money) in communicating to water the force (heat) contained therein, and then to allow that force to pass useleasly into the air. We should not have enjoyed that immunity from boiler explosions in Cornwall were it not for the fact that they are made of thicker plate, better material and workmanship, than in the North of England. Galloway tubes may be recommended, but strengthening rings are best in theory, in practice I find them a source of annoyance and trouble, the plates are sadly deteriorated, and soon require repairs even when fixed by most competent men. The tubes are sufficiently strong and well made to resist any pressure required of them, and where there is a moderate amount of skill and attention exercised, there can be no fear of any explosion.

BULL ENGINE.

The direct-acting bull-engine is now coming into more extended use in Corgwall and the northern mining districts. The piston is directly attached to the pump-rods, and the whole machine supported on framework over the pit or shaft. Its advantages are compactness (probably three bull-engines might be erected in the same area as one beam-engine of the same power), and less first cost in engine and buildings; but, on the whole, the duty obtained has not been quite so great as in the beam-engine, and where first cost is not of so much importance as permanence and high duty, the single-acting beam-engine must be recommended for its high degree of expansion; isolation of steam passages and piston cover from the cooling effects of the condenser, great speed of piston, and small amount lost in steam passage. The Cornish single-acting engine cannot be recommended for small powers—say, 30-horse power—but I prefer the beam-engine with the common reciprocating plunger-pump rather than the horizontal; in this case also, and as economy in first cost of works is generally considered, I say this type of engine can be rendered equally cheap; the pillars, entablature, and framing, &c., must be self-contained, and should be made of sufficient strength to increase the power of the engine from time to time as the sinking of the shaft progresses, and when the requirements of the mine are greater a new cylinder and pump may be added at a cheap rate, and a few hours stoppage of the engine should suffice to put them in place, if the design is properly arranged.

PITWORK.

The ordinary pitwork, or pumps, as applied in Cornish mining cannot be excelled, nor has it been equalled in any country, and its action being so exceedingly simple requires but little comment. The plunger is peculiarly adapted to the Cornish single-acting engine, it requires but little attention, and can be kept in order by any ordinary working miner, the water being forced by the weight of pump-rods and its attachments; there is not the least shock or vibration, and this is so nicely adjusted by the balance-bob that the engine is properly balanced, leaving the weight of rods only sufficient to overcome the column of water, which arrangement is also conducive to economy.

WATER POWER.

If water-power is to be had cheaply this will be utilised by the employment of water-wheels, which should not be of more than 40 ft. in diameter; when this size is exceeded better duty will be obtained from two wheels of less diameter. In many cases it pays to bring the water in flumes from a great distance, and this system requires the early attention of the engineer. I have known many districts in Australia where it pays well to dam up the rain water collected from large areas, and conduct it to water-wheels on the mine for ore-dressing purposes. In the Beechworth mining district, for instance, considerable over 1000 miles of water way have been constructed at enormous cost. This same thing might be done in Cornwall and elsewhere to advantage and profit. Considering the present alarming state of the coal market it would be wise on the part of mining engineers to turn their attention to water-power. Groaning under the heavy price of fuel, and its probable cost this winter, will not provide an antidote, but utilising the waste water (and there is a considerable waste in the dressing operations all must admit). I have known in the Ballarat district, in Victoria, 500 to 700 gallons of water used per stamp-head per hour, and I find a fair average assigned to Beechworth of from 100 to 400 gallons per hour; Sandhurst, 200 to 500 gallons; Maryborough, 200 to 1000 gallons; Ararat, 120 to 480 gallons per hour. This clearly shows a useless expenditure of power, as it is a well-known fact that quartz crushes faster when there is not an over-supply of water. In passing through the Cornish mines one is struck with the enormous quantity of water used and run to waste. Not having time at my disposal I have had no means of getting the correct quantity, but the maximum here shown, perhaps, is less than in our western mines. Now, all this waste is so much power lost, and should be applied to the driving of improved machinery—pneumatic stamps, pulverizers, jiggers, &c., to be described further on, by the aid of water-wheels, or, more preferable, perhaps, the most approved construction of turbine, which height of fall and other circumstances must decide. The doing away with steam-power to some extent, and keeping a strict tabulated account of duty performed by the pumping-engines, with a little encouragement to the enginemen, we shall obtain a better duty, and the coal bill will decrease materially. By damming up this waste, and collecting the rainfall (say) in the valleys, as is often done in the gold fields, a vast source of power can be obtained, and the stuff can be run down a self-acting incline by double rope, with loaded trucks or water-boxes with self-acting valves—that is, as the boxes arrived at the bottom the valves would open and run their contents into the reservoir, the laden trucks would then run down, and even in old established mines this system would be found profitable. The same useful effect can be cheaply produced, with a wire-rope railway or two stationary wire-ropes stretched on posts, the descent of the loaded buckets on one rope would cause the ascent of the empty ones on the other by means of a small rope attached, a little practice would so regulate this that it will work with the greatest precision. When passing through the Cornish mines I was forcibly struck with the loss of power there must be in using such long lengths of flat-rods, some of which extend upwards of half a mile, now this system should be discarded, and transmit the power through a line of water-pipes, which can be laid down for less than half the cost, and the repairs and risks of breakage would be trifling compared with the present system, and it might be found in many cases by far the most economical plan to conduct the streams from remote distances, when numerous ore-dressing machines might derive their power from the same line of pipes. An instance of the value of water-pressure machinery may be seen at the London Docks, where over four miles of pressure-pipes are employed, and driving more than 100 machines; in this essay it cannot be expected that minute descriptions of every machine can be given suitable for best mining machinery, which would occupy more space than can be spared; but for examples of such machinery I must refer the reader to the recent improvements in this class of machinery made by Sir William Armstrong, and may be seen in operation at the various railway stations, docks, and some mines in the North of England. Even water from adits might be utilised in driving turbines and dressing operations carried on at the mouth of the adit with economy; self-acting inclines are inexpensive for carrying down the stuff, and water is always a cheap and steady power; during the last winter a quantity of water might have been stored for the summer when we hear of many stamps stopped for want of the very water we so carelessly allowed to flood our mines; the surface drainage is considerable, and races should be cut in suitable places for conducting the heavy rains to reservoirs, and sufficient water would be then stored to meet the wants of ore-dressing during the summer months. A scheme might be introduced in some of our great mining centres, whereby enormous areas might be constructed into reservoirs cheaply, and the drainage of the hills, water pumped from shafts, and waste from machines would be collected and let to parties employing machinery for crushing and dressing at per horse-power obtained. No doubt in some districts this would be found a source of profit and great utility to the neighbourhood; stamping and ore-dressing mills would be erected in close proximity to the water. I have seen windmills also employed to pump into the reservoirs. If our mines are to continue to pay largely hydraulic machinery must be employed. I have no doubt coal will be scarce and at a high figure this winter, and probably a difficulty will be experienced in keeping the engines going, especially in young non-dividend mines.

WINDMILLS.

In the open and wild moors and downs in Cornwall and other barren mining districts, where the wind is almost perpetual, and every breeze is telling us of wasted power, windmills might be constructed to drive those pneumatic stamps with self-feeding hoppers and other appliances. Such a cheap power and apparatus, no doubt, would give good returns. This power has not been tried so extensively as it deserves, but the price and scarcity of fuel will compel many engineers to pay a little attention to this and water powers, especially in desert and mountainons mining regions abroad. When we consider the vast amount of work done in Holland with those machines, the capacity of many exceeding 100-horse power, it seems marvellous that our present engineers have neglected one of the great sources of power Nature has so bountifully supplied us with.

[*To be continued in next week's Journal.*]

NEW DRILLING MACHINE.—Messrs. BRYDON and DAVIDSON, of Whitehaven, have patented some improvements in machinery or appatus for drilling, boring, or cutting rock, or other hard substance. A cylinder of two diameters, each fitted with a suitable piston, the larger diameter being at the lower end of the cylinder, through which the piston-rod for holding the cutting or boring bar passes, thereby enabling the return stroke to be made quickly, and compensating for the loss of piston area due to the piston-rod. The actuating of the valve of the cylinder, directly from within the cylinder, between the steam ports and the two pistons, thereby dispensing with the use of external valve rods, stuffing boxes, and other parts. The cylinder is provided with two screws running parallel to it at its sides, carried by screwed nuts connected to a wrought-iron jacket provided with a cross shaft, having suitable actuating handles and worms taking into the said nuts for adjusting the position of the cylinder, and so feeding the drill. The wrough-iron jacket is connected to the stand or main supporting frame of the machine by means of a universal joint provided with a screwed wedge, so contrived that by the turning of a single nut the jacket may be securely fixed at any suitable angle to which it may have been moved, or as readily released for fresh adjustment. We dispense with the glands ordinarily used for preventing the escape of the steam or other motive fluid from the cylinder, by means of an internal ring or washer, through which the piston-rod passes, and between which and the cylinder end suitable packing is interposed, the washer or ring having suitable holes to allow the motive fluid to pass to the packing. Their method of actuating the slide valve from within the cylinder between the steam ports is applicable also to apparatus in which only one piston is employed.

Meetings of Public Companies.

DEERPARK MINING COMPANY.

A special general meeting of shareholders was held at the company's offices, Gresham-street, on Wednesday,

Mr. ANDREW GRAY in the chair.

Mr. E. T. R. WILDE (the secretary) read the notice convening the meeting.

The CHAIRMAN remarked that his co-directors had asked him to preside because he had been most recently at the mine. Only 760 shares having been subscribed out of the 2500 shares which in January last it was decided to issue, the chief object of the present meeting would be to consider the best means of raising money for the further development of the mine. He would first ask Mr. Wilde to read Captain Bucknell's report, as follows:—

May 31.—Since the last general meeting our underground operations have been to sink the shaft, which is 5 fms. below the deep adit. The deep adit is driven 10 fms. 4 ft.; the lode still continues its size, and has a very promising appearance; the sulphur mundic is diminishing, and peach is now to be seen in large quantities through the lode, producing a little tin, which is a very important feature, and no doubt when we get under the lode driven through at the 30—a point which will be reached in about 2 or 3 fms. I look forward to this with the greatest anxiety, as I fully believe from the indications which present themselves we shall have a good lode of tin. The bottom cross-cut is driven about 9 fms. The winze is sunk in the bottom of the adit about 3 fms., in a very promising lode. The 30 is driven about 9 fms. 2 ft.; we have intersected the lode west of cross-course, which is heaved south about 4 ft.; so far as seen it presents a promising appearance. Still we find good stones of tin in a branch that leads to the lode; this speaks well for the future. I believe when we get off from the influence of the cross-course we shall have a good lode; at any rate, the indications warrant it. Lay open the mine, and it will be equal to its rich neighbours, I beg to refer you to Capt. Richards's report of Excelsior Mine of May 4; this valuable lode runs through the entire length of your property, which is another very important feature, as it produces tin in such large quantities at such a shallow depth. The facilities your property possesses, as a rule, cannot fail to give you ample satisfaction when properly developed. The main object now is to raise capital to sink the engine shaft, extend the levels east and west, and no doubt when this is accomplished the mine will become one of very great importance. I may further say the engine house is covered in, and we shall commence on Monday next to heave in the engine.—Capt. BUCKNELL.

The SECRETARY then read a report from Captain Goldsworthy, of Wheal Crebor, who had accompanied the Chairman upon his late visit.

The CHAIRMAN said they were disappointed, as the shareholders generally doubtless were, because they were called together to provide more capital. The reason of this was that they had not been gaining an inch in depth whilst driving the adit level, and it was only within the last month or six weeks that they had driven the adit level to the shaft, and thus secured good ventilation. It should be recollected that it was only 12 months since the shaft was commenced, and he believed all connected with mining would admit that to get it down 40 fms. in that time, and get it cased and divided, was very good work. Being now below the adit level they had more water, and would require their engine power; their engine, however, was purchased, and with it they would be able to keep the shaft, drained to a considerable depth. They were led to expect that tin enough to pay for stoping and stamping would be obtained from the backs in the adit level, for it was usual to calculate that a lode might be considered equal to that seen for 6 fms. up and 6 fms. down; but they found in this case that the lode did not hold up in the backs. The ore from the bottom which they had had assayed had given favourable results, but the expense of taking it away underhand was too great. They must sink the shaft another 10 fathoms, and would then put out another cross-cut to the lode. The shaft will intersect the lode at the depth of 55 or 60 fms. from surface, and will then be continued on the course of the lode. The directors thought it desirable to call the shareholders together before deciding upon the means to be adopted to raise the necessary capital. There had been 5665 shares taken up in the aggregate, and the law charges had been but 15*l.* 15s., exclusive of the 20 guineas for the lease, so that they could not complain of their solicitor. Up to the end of June their liabilities and assets would about balance each other. He read a note from Capt. Goldsworthy, received that morning, expressing his good opinion of the mine, and stating that it had excellent chances of good and early results. And that, he continued, was from a man who had the reputation of not being over sanguine. The directors had increased their holding since the beginning of the year, and now held about one-third of the shares taken up, so satisfied were they that good results would be obtained. They had already sold one parcel of tin—a small one, it was true—and had about the same quantity nearly ready for market. The 8 cwts. sold realised 29*l.* 12s. 6d., and was enough to show that they had tin, and as they got deeper there was no doubt that the value of the lode would increase. They should remember that at the beginning of the year the directors stated that they would require 5000*l.*, of which 1500*l.* only had been provided. They had one of the best mines in the district, and all were equally interested; it was, therefore, most desirable that the necessary funds for working it should be provided.

Mr. RANSFORD understood that the adit had turned out *nil*.—The CHAIRMAN said it was scarcely so. The tin did not hold up in the back of the adit, but in the bottom of the adit the tin was very good; and when they got under it by driving a deeper level it would be turned to account.

A SHAREHOLDER understood that money was required to pay for the steam-engine.—The CHAIRMAN said that the money was required for the general development of the mine. The engine was not paid for, but there was money to pay for it. The constituency of the company was a highly respectable one, and consisted of about 140 shareholders; and it was most necessary that they should make "a long pull, a strong pull, and a pull altogether" to secure the development of the mine. Taking the shareholders at 135, they would see that if each would undertake to subscribe for or place 30 shares it would take nearly all the shares remaining to be allotted. The lode had not proved valueless hitherto, and towards the west there was good reason to expect that it would be considerably better.

The CHAIRMAN thought that as soon as possible they ought to sink on the great gossan lode, as Capt. Richards, of Devon Great Consols, had told him that the indications there were precisely similar to those which had been seen at the Devon Great Consols before the great discovery there, from which 70,000*l.* worth of ore was raised in one year. The proposition of the directors was that every shareholder should have the option of taking 30 shares, the payments on which would be extended over nearly 12 months. In the Articles of Association, as amended at the beginning of the year, the remuneration to be paid to the directors was increased from 300*l.* to 400*l.* per annum; but the directors had determined to take no advantage of this change until the mine reached a dividend-paying state. The directors had determined, moreover, to place 100 of their own shares, free from all liability, at the disposal of the company, to be given as a 10 per cent. bonus to the subscribers of the first 1000 of the shares to be offered. They had had under discussion the issue of preference shares, but they thought it undesirable to have two classes of shares in a mining company, and unanimously concluded that preference shares ought not to be issued. They hoped that the shareholders would come forward to take up the shares as proposed: and the directors would guarantee that if 2000 shares were taken within a month they would take or place twice their *pro rata* shares, or 60 shares each. They had made arrangements with Capt. J. Goldsworthy, of Wheal Crebor, to take the general superintendence of the mine in the event of the shares being subscribed, Capt. Bucknell continuing resident agent; and the directors believed that the effect would be to increase the value of the shares. If the mine showed reserves of ore such as they expected to open up in the next six months there would be little to complain of.

Mr. BURBIDGE regretted that so small an amount of capital had been raised in the first instance, as, with their recent financial position, he doubted whether they could really afford the expenditure for the engine, and thought it would have been better if the money had been expended underground. It was a common fault in mining to make heavy expenditure upon surface arrangements before ascertaining what quantity of ore would have to be dealt with; it was, however, useless to refer to this now. Passing on to the directors' proposition, he did not think it possible for them to say at the moment what they could do; he would, therefore, ask whether it would not be advisable to adjourn the meeting, in order to obtain a reply from each shareholder? His principal object in speaking was to know whether they were required to give a definite answer at once. Many would be disinclined to subscribe, himself among the number, except contingent upon a certain number of the shares being taken up. He would be willing to take 30 shares if 30 others did the same, but would not like to be the only one, or one of a few, subscribing. As it had been suggested to make some addition to the board, he thought it would be very desirable to appoint Mr. Ransford.

The CHAIRMAN, in reply to questions from shareholders, stated that there was about 15 fathoms to sink to bring the shaft down upon the lode, and the cost would be from 20*l.* to 25*l.* per fathom, so that from 300*l.* to 350*l.* would be required in the shaft. There was always some unremunerative work in mining. The directors did not admit that there had been any extravagant expenditure, but, of course, if they had known 12 months since what they had now ascertained from working they would have acted somewhat differently. They would not, for instance, have yet erected the 12 heads of stamps if they had known that in driving the adit they would have had no tin in the backs. The engine, however, was absolutely necessary.

Capt. BUCKNELL stated that they could not get down to the lode until they had the pumping machinery and engine in working order. The only expenses now going forward was the driving of the adit west of the shaft to the cross-course.

Their engine must be put in, in order to get below the adit, as they had got quite as deep as they could with horse-power. He certainly thought they ought to drive on their adit to the cross course, indeed it would be folly to stop it, as the ore was always best at the cross-courses. But nothing was going on at surface that could possibly be avoided, and no money had been unnecessarily expended at all. As to the engine, it was a very good one, and 40-in. cylinder, and he hoped that they would not want any other for the thorough development of the sett.

The meeting was then adjourned for three weeks.

IMPERIAL BRAZILIAN COLLIERIES (LIMITED).

The half-yearly meeting of shareholders was held, on May 31, at the Cannon-street Hotel,—

Mr. BRYDGES WILLYAMS, M.P., in the chair.

Mr. DAVID L. DUVAL (the secretary) read the notice calling the meeting.

The CHAIRMAN said there was really very little to do on the present occasion. The meeting was called in compliance with the wish of the shareholders that half-yearly meetings should be held. Since last meeting little had been done, except that Mr. Laity had gone out to visit the mine, and a letter had also been received from Mr. Johnson, the manager out there, which the directors considered was of a satisfactory nature, and which, perhaps, the shareholders would like to hear.

The SECRETARY then read Mr. Johnson's letter, as follows:—

Sao Jeronymo, April 7.—I hear there is a special mail to-morrow, in consequence I take the opportunity of informing you that we are getting on with our works as well as can be expected. We have about 4 miles of railway ready, and the new pit is now 8 yards deep, and secured; we have had one fall, but luckily the weather was fine, and we managed to get it bricked up and secured with strong iron hangers. As there is a general meeting of the shareholders in the month of May, I wish to make a few remarks, as I understand great fault was found in not having the works and railway ready for working out coals at the last meeting. In the early part of July last I received at Sao Jeronymo the first portion of rails, from that time to January this year I have received the whole (tools and machinery), and last of all I received the locomotive, and we had it ready for trial on January 29 of this year. The most of the heavy machinery had to be taken 10 miles across a wild country in carts of the country drawn by bullocks.

I promised, when in England, that in six months after the arrival of the rails, machinery, &c., I would have the works in order, and in nine months paying a dividend. I will keep my word if I am not stopped again for want of means to pay my expenses. I expect by the early part of June to have the pit and railway completed. In the meantime I shall get a few hundred tons of coal ready at the old shaft to be sent away as soon as we get near with the railway. Since my last I have another application for 260 tons of coal to Montevidio, and an application for 20 tons as a trial in the drudge boats working near the bar of Pilotas. I have not the least fear of the ultimate success of this undertaking.

The CHAIRMAN said he thought the shareholders would agree in thinking that the letter, as far as it went, was satisfactory, but further information would be given when a report was received from Mr. Laity. The directors would be happy to answer any questions, and to give every information in their power.

General DE SALIS: When do you expect this report from Mr. Laity?

Mr. PEMBERTON, M.P.: Not before September; we cannot get it home before. Immediately we receive Mr. Laity's report we shall send it to every shareholder.

Mr. CLARKE said he thought the law costs, 255*l.*, were rather heavy.

The CHAIRMAN said they included the period from Feb., 1872, to March 31, 1873.

The CHAIRMAN, in answer to a further question, said that the directors' fees were on the reduced scale fixed by the shareholders at the last meeting.

Mr. CLARKE asked for some information respecting the item "expenses attending petition to Government to annul Edward Muesler's concession, 433*l.* 6*s.* 8*d.*"

Mr. WEBB explained that Mr. Muesler made an application to the Brazilian Government to grant him a concession for working of coal mines, and as a concession had been granted to this company to select sites to sink pits for a limited period (which had not yet expired), the directors instructed their agents, Messrs. John Moore and Co., of Rio, to oppose the application. This they did, and the above amount was the charge they made.

Several shareholders expressed an opinion that it was rather a large amount to pay for reminding the Brazilian Government of its obligations to this company.

The CHAIRMAN, in answer to a further question, said there was no doubt that this company's title was perfectly right and clear.

A SHAREHOLDER asked how the debentures authorised to be issued at the last meeting had been taken up?——The CHAIRMAN said that of the 10,000*l.* authorised at the last meeting the shareholders had subscribed for 3200*l.*, and the directors 4850*l.* The directors would like to see the remaining small amount subscribed for.

The resolution for the adoption of the report and accounts was then put, and carried, a vote of thanks was passed to the Chairman and directors, when the meeting broke up.

GWYNGWILLIM COLLIERY COMPANY.

The first ordinary general meeting of shareholders was held on Tuesday, at the offices of the company, Lothbury,

Mr. ROBERT WILLIAM BILLINGS in the chair.

The notice convening the meeting was read by Mr. LAYTON (the secretary).

The CHAIRMAN said the present was the usual four-monthly meeting that all companies had to submit to, and whether there was any business to be transacted or not the board was obliged to call the shareholders together within the prescribed time. Having said thus much, it remained for him to state the actual condition and prospects of the company. In the first place, he might observe that the directors had reason to believe—and that was why they had taken certain different steps that he should explain later—that they should carry this undertaking through with something like half the capital that had been stated in the original prospectus; that, of course, meant if they did it successfully, that the dividends to the shareholders would be increased by so much. (Hear, hear.) That, he thought, was a self-evident proposition. Now, in regard to their present financial position. As the shareholders would doubtless remember, the vendor was entitled, according to the terms of the prospectus, to 2500 fully paid-up shares, and 5000*l.* in cash, such being the amount of purchase money. Well, they were now fortunately rid of both these claims, for although they had not issued the whole of the shares as yet they had been enabled to pay the vendor in full. (Hear, hear.) And the vendor, in return for that, had shown his confidence in the success of the undertaking by subscribing personally, and paying up in full, for 1250 shares, so that he had now a real monied interest in the concern. He had done that from his own personal knowledge of the colliery, and he (the Chairman) confessed that had he been in his (the vendor's) place he should have done the same thing; indeed, he doubted whether he should have parted with the property at all, for it appeared to be so easily managed when they had pushed operations a little further. Now, under those circumstances the company had a certain sum of money in hand, another certain sum which varied from day to day (being the amount due to them on the calls) and they had a certain number of shares to place. This he had no doubt would be done in a short time, for it was not a very large number, and they would then have, according to all appearances, and according to what any man of business would consider the truth, ample funds to develope their colliery, and to bring it to a successful issue in regard to an output of coal. As to that, he might say from his own knowledge of their property, having visited the mine and observed the facilities for working the coal, that he could himself knock out a ton of coal in twenty-four hours, the produce was lying so bare, and so easily workable. Passing on from that subject, he might state that they had ample assets at the present moment out of the first 20,000*l.* of capital, after paying the vendor and considering the vendor's shares as capital, fully sufficient of itself to make an ordinary railway to join the present railways of the other collieries, and to go into the siding which they had a right to, on the Neath Valley Railway; but the board had nearly concluded a very important contract for the construction of one of Hughes's patent tramways. If that agreement were carried into effect the result would be, according to their very minute calculations, that the railway would actually pay itself and become the company's property within 18 months. Perhaps that was the most important step that had ever been taken in regard to a railroad, for not only would it eventually become their property, but they had the right, if they found themselves working profitably, of purchasing the railway, and whatever they had paid on account would go in part purchase. And here he desired to take the opportunity of observing that the directors were as deeply interested in the success of the undertaking as the other shareholders; in fact, more so, for he and some of his colleagues were among if not actually the largest shareholders. (Hear, hear.) That fact might, therefore, be regarded as evincing the confidence of the directors in the concern, while it would at least assure the proprietors of this, that while earnestly endeavouring to promote their own (the directors') interests those of the general body of shareholders would be well served. Referring again to the question of communication—or, rather, of transport—he observed that the contract for the construction of the tramway might be considered as concluded, and assured the meeting that as soon as completed it should be in active work. In fact, the completion of the tramway and the working on the levels at the colliery's mouth should be a simultaneous operation. By that time their platforms and everything requisite for carrying on operations should be in working order, and the company would be in a position to commence sales. He firmly believed in the truth of the thing, and was convinced that it would prove to be a sound and highly remunerative property. (Hear, hear.) As he had already stated, there was no occasion at present for carrying their capital beyond one-half of what they had at first proposed. If their tramway scheme was carried through they would have, with their present capital of 20,000*l.*, a considerable sum in hand; and even in the event of having to make an independent railway they would have enough to do it. In regard to the interest on the shareholders' capital, Col. Mortimer and himself were in receipt of sufficient money from the vendor, according to agreement, to pay their 5 per cent. for the first year, or so much of it as the time would permit. For instance, those shareholders who chose to pay up their shares in full before June 14 would get the 5 per cent. for the year, those who paid before August 25 would receive interest for nine months, those who paid before Nov. 25 would receive interest for six months, and those who paid before Feb. 25 next would receive interest for three months. That was to say, the proprietors would get three months' interest for paying their money one month beforehand. The directors had entered into such an arrangement, and they thought it a very fair and equitable adjustment on both sides. It was liberal to the shareholders, and he thought it was just to the vendor. In conclusion, the Chairman reminded the meeting that of course they were at present in a preliminary condition, and expressed the hope that before the shareholders were called together again the company would be in successful working condition; and if that were so he had very little doubt that they would be in receipt of something more than their guaranteed interest. Of course those things varied, and it was impossible to calculate with perfect certainty upon the results of the future, but in all reasonable expectations they would pay certainly very much larger dividends than the amount of guaranteed interest. (Hear, hear.) And if it did not do that in perpetuity their property would be unlike every other colliery where the coal was lying before the miners ready to hand.

Mr. ASHTON, as one of the shareholders, expressed the pleasure he felt at the Chairman's statement.

Mr. G. NEWSOM echoed the opinion of the last speaker, and expressed the hope that the working of their colliery in the future would be satisfactory to all concerned.——Capt. WALROND CLARKE (director) desired to say as a colleague of the Chairman that he could verify every word that he had so ably put before the meeting that day. He must confess that their Chairman deserved the thanks of the shareholders for the trouble he had taken in regard to this company. Mr. Billings had most kindly consented to visit the mine twice, and, therefore, it was very satisfactory that he could inform them as to the actual condition of their property, not only from what the engineer had stated, but from his own personal knowledge.

Mr. H. BRAST enquired whether the representations made in the prospectus regarding the value of the mine were overdrawn?——The CHAIRMAN said he had carefully measured their property, and made other similar calculations, with the view of testing the accuracy of the statements referred to, and the result of his examination of the mine more than verified them—in fact, he considered the property more valuable than it had been represented. He had seen the coal burnt, and it gave a very dull fire, of course, as it was a steam coal; but it was a very intense fire, and thus proved eminently satisfactory. As regarded the proposed means of transport—a sort of wire tramway—by employing that means they would scarcely interfere at all with the land over which their produce would pass, and the consequence would be that their way leave would be reduced to an absolute minimum; in fact, he anticipated it would form hardly an item in the accounts.

Mr. BEDFORD (the vendor) said, in reply to questions, that Mr. J. Richardson, who had some years ago reported on this vein in a neighbouring outlet, had said that 1 lb. of this coal would evaporate 9 lbs. of water, and that was a very large amount. He might add that some three or four years ago some borings had been carried on about 16 ft. to the eastward upthrow of the fault, and the coal there now was precisely the same as in the Bedford Colliery, and in that colliery they had no small coal whatever. The coal raised from the same vein as that in their colliery was all workable coal, and realised the highest prices in the market.

After some further desultory discussion, in the course of which several other questions were put and satisfactorily replied to by the Chairman and others, the proceedings were brought to a close with a vote of thanks to the Chairman.

COAL CONSUMERS' ASSOCIATION.

The first general meeting of shareholders was held on Tuesday at the London Tavern,—Lieut.-Col. T. Y. HOLLAND, C.B., in the chair.

Mr. J. E. COWAN (secretary) read the notice calling the meeting.

The CHAIRMAN said that the present meeting was held under the Act, which required a meeting to be held within four months after the registration of a company. In the case of this association, what he might call "the very chains of custom and of privilege" had been broken through by the issue of the prospectus, demanding not payment in money on application for shares, nor, indeed, any money at all until some days after allotment. It had been more difficult than usual to get into business trim, and it was only within the last four or five weeks that the directors had been placed in the possession of any funds at all with which to commence business. The object of the association was to raise capital amongst the consumers of household coal, for the purpose of purchasing or leasing collieries, and otherwise acquiring coal at a moderate price. It was to be worked entirely upon the co-operative principle, the miners and all employees having the opportunity of becoming shareholders. The first object of this association was that the coal consumer might become a coal proprietor by subscribing about two-thirds of his present annual cost, the members receiving coal at cost price, and the shareholders would, in the case of the first issue, be entitled to 10 per cent. per annum on his small cash investment. In the recent immense rise in the price of coal the consumer had been a great sufferer; but he trusted that the present endeavour to unite in the bonds of common interest capital, labour, and custom might not only remedy this, but also help to bridge over some of those social chasms which now, unfortunately, separated man from man and class from class. Unless some endeavour of this sort was made it would be utopian to expect any marked reduction in the price of coal for at least some time to come. In fact, they must face the certainty of dearer coal than they had been accustomed to. They might expect, as a consequence of the recent crisis, the opening up of new coal mines, or the resurrection of abandoned ones, but all this would be a work of time, and meanwhile, although there might be fluctuations in the price of coal, they must lay their accounts permanently with coal at a higher price than they had been accustomed to. Between the pit and the consumer there were several persons who made a profit out of the coal, and that could only be met by protective action on the part of the coal consumer, to combine the profits of the colliery owner, the coal factor, the coal broker, and the retail dealer, for the benefit of the coal consumer. Why should not cheap coal be as good a cry as cheap bread? Why should not the emancipation of the family coal scuttle stir all hearts? At the Haymarket stores of the Civil Service Association might be seen coronetted carriages used by economical countesses to carry away their cheap soap and inexpensive candles. One could hardly expect to see carriages and barouches turned into coal wagons; but he could not understand how Englishmen, who resented taxation elsewhere, could so readily submit to the high prices imposed by the purveyors of coal. Large profits, as he was aware, were inevitable in a trade where the article supplied was in such steady demand, or where public caprice and fashion might lead to loss, or where capital has to be reserved or unprofitably locked up for years, or where great tact and thought were required to meet the fluctuations in trade; but in the coal trade nothing of the kind was known, yet was a simple article in steady and universal demand, and every consumer knew what he required, or was likely to require, in the year, the price he was willing to pay, and the quality he preferred to consume. It was, therefore, something astounding that hitherto no proposal had been made to secure a good coal at a reasonable price. He, therefore, thought that a deep debt of gratitude was due to the founder of this Association, Mr. Brice, who had organised a practical plan of grappling with the concerted action of colliery owners and coal factors, by forming such an association as this. The report showed that the number of applicants for shares was in round figures 4400, the number of shares applied for being 44,684, or about ten to each applicant. The report also stated "After examination of a number of collieries the directors have succeeded in making favourable arrangements for the supply of excellent house, cannel, and steam coal, and they will be in a position to deliver this coal to the shareholders as soon as the necessary stock is in each depôt, of which due notice will be given by advertisement to the shareholders." There were three collieries absolutely fixed, and the output guaranteed to this company was 60,000 tons per annum, for three and five years, at from 7*s.* to 8*s.* 6*d.* per ton. One colliery had agreed (but no payment had yet been made) to an output of 30,000 tons per year, for three years, at 8*s.* 6*d.* per ton. Two other collieries had been approved as good purchases, and they would be secured if money were furnished soon enough. There are 250 railway trucks now being built for the association on the seven-years payment system (of 2 and 3 tons each). The following London depôts were already freed, and would commence work as soon as stocked with coal: Mileage—Paddington, Bayswater, St. John's Wood, and Notting Hill, Kensington, Pimlico, Chelsea, Brompton, Woolwich, Plumstead, Charlton, Blackheath, Lee, and Lewisham: King's Cross, W.C. district, Islington, &c. The following depôts were being fixed:—Finchley-road, Haggerston, Wandsworth, Wimbledon, Old Ford, Croydon, Kingston, and Battersea. In conclusion, the Chairman moved the adoption of the report and accounts.

Capt. SELWYN, R.N., seconded the resolution, which, after a few words of explanation from Mr. BRICE, the manager, was put to the meeting and carried.

Mr. James and Mr. Wilkins were then elected auditors, and the proceeding closed with a vote of thanks to the Chairman and directors.

SKERNE IRONWORKS (LIMITED).

The first annual general meeting of shareholders was held on Friday, May 30, at the City Terminus Hotel.

Lieutenant C. F. D. GREY in the chair.

Mr. R. R. BEST (the secretary) read the notice calling the meeting.

The report was taken as read. It stated that the net profits for the year ending March 31 amounted to 17,486*l.*, and that after deducting from this sum 3933*l.* for interest paid to the vendors, and on calls paid in advance, 3000*l.* transferred to the reserve and depreciation fund, the interim dividend of 5*s.* per share, paid in October last, and the income tax for the year, there remained a balance of 7552*l.* Out of this the directors proposed to pay a dividend of 15*s.* per share, which would absorb 7500*l.*, leaving 52*l.* to be carried forward to the next account.

The CHAIRMAN said that before proposing the adoption of the report and accounts he would just run through the different points contained therein, and give such explanations as occurred to him. In the first place, the directors showed that they had made a net profit of 17,486*l.*, and a portion of that had already been expended —some 4000*l.*—in payment of interest to vendors. Another sum of 3000*l.* had been placed to the credit of the reserve fund, an interim dividend of 5*s.* per share had been paid, and there was a balance remaining of 7500*l.* odd. Out of this balance the directors proposed to pay a further dividend of 15*s.* per share, which would pretty well absorb the whole of it. In the next paragraph the directors stated that the result of the year's working had not been so satisfactory as they anticipated. That, he had no doubt, every one was prepared for; indeed, they were all aware of the circumstances that had affected the trade of late. At the last meeting he took the opportunity to state that the directors had considerable anxiety as to the future. At that time prices had risen very considerably. Coal at that time had not materially increased, but still there was a rise, and things were likely to be dearer. Since the meeting the company had been paying something like 100 per cent. more than the prices they paid at first, when the undertaking was formed, and this had decreased the profits considerably. With reference to pig-iron, at the time of the last meeting the prices had risen something like 30 per cent. on those that were quoted when the company was formed, and since that period, instead of matters having mended themselves in this direction, there had been another rise, and the directors were now paying about 60 per cent. more than they did at first. Although it was unpleasant it could not be a state of things which could last, for the inexorable law of supply and demand required that things should right themselves eventually, and although it was annoying to see trade leaving this country, and even our Government contracting with foreign firms for materials, yet, as they knew, this was not a new thing, and it would be a penny wise and pound foolish policy for the Government to purchase iron and other material abroad. He, therefore, looked upon this as simply a question of the moment; but the real difficulty had been the great labour question, which had grown gradually, and where it would end it was impossible to say. Indeed, this was the Gordian knot with which the directors had to contend, and there were some thinking men who doubted whether it would be practicable to solve it except by the strong arm of the law. This, however, was not the policy of the age, for this was a free country, and everyone might do as he liked. However, there stood the Gordian knot, and the question was what was best to be done with it. Some had endeavoured to unravel it, and others had covered it over. Of late years there had been discovered a sort of panacea, a rich kind of enamel for covering over the knot, with the view, no doubt, of making it beautiful for ever. (A laugh.) This panacea was called arbitration, but this only disclosed the knot uglier than ever, but the cry was—"Never mind, put on more enamel." If it were necessary to go beyond this company's own business for an illustration he might speak of a costly enamel with which the country covered over the knot in the arbitration at Geneva. In the iron trade the directors of the company paid in wages from July last to the extent of 12½ per cent. extra a month, but a month had scarcely elapsed before the men demanded more, so that at the present time they were paying 25 per cent. more wages than when the company was formed; indeed, during the year the board estimated that they had paid for labour 4000*l.* more than was paid the previous year. There was no doubt that it had been a sort of black mail on capital. The labourers were not in good hands, and were acting blindly, and if they continued in the course lately pursued they would pull down the fabric of commercial prosperity, and involve all in a common ruin. But it was to be hoped that things would not come to such a pass. He would now briefly compare the prospectus of the company with the actual results of the year's working. In the prospectus it was estimated that the company would make of plates from 22,000*l.* to 23,000*l.* annually, and of bridge-work another 2000*l.* annually. Well, what had been the result? They had made plates over 20,000*l.* and bridge-work to very nearly the sum estimated. Then, again, in the prospectus the board made their calculations of profit at the rate of 25*s.* per ton. It would be seen in a moment how very moderate was this estimate, for he might tell them that the cost of making the finished plates since the company began to take its profits had increased nearly 80*s.* per ton, whilst the increase in the selling price had only amounted to 48*s.*, or a deficiency of 32*s.* per ton; therefore, if they had estimated exactly in the prospectus the profits per ton they would be now working at a loss of 7*s.* per ton. But the accounts showed that this was not the case, and, therefore, it only proved the moderation of the promises which were held out in the prospectus they issued. The accounts spoke for themselves, and had been carefully audited by the auditor. The works themselves were in a better condition than when the company took them over, and, therefore, they were in a position to make the best of anything which might occur. He was happy to state that the directors had only that day received information that the strike in the Cleveland district was likely to terminate. The company had been working under a disadvantage, inasmuch as it had no uncalled capital, and had been obliged to pay cash for everything, but the directors had lately been carefully considering this question, and probably they would shortly take steps to supply themselves with working capital by raising a small amount of money on mortgage. In conclusion, he (the Chairman) moved the adoption of the report and accounts.

The resolution was seconded by Mr. J. H. LLOYD, and carried.

On the motion of the CHAIRMAN, a final dividend of 15*s.* per share was declared for the year ended March 31.

Mr. J. H. LLOYD (director) said the total dividend for the year was nearly 8½ per cent. He thought some portion of the capital should have been laid aside in the first instance for floating capital, and he would have preferred the dividend to be devoted to that purpose. He regretted that such a mistake had occurred, for it had hampered the operations of the company, especially in the North; but, to save the dividend, an amount of 8000*l.* or 10,000*l.* could be raised by mortgage with great benefit to the company. He would earnestly recommend the shareholders not to part with their property, for the present state of affairs affecting the company could not possibly last, and if the prices of material rose, the price of the manufactured material would also rise. (Hear, hear.)

The resolution for the declaration of the dividend was then passed.

Messrs. Price, Holyland, and Waterhouse, and Edward Cheshire, Esq., were, on the motion of the Chairman, re-elected auditors, and the proceedings closed with the usual vote of thanks to the Chairman and directors.

ROSSA GRANDE GOLD MINING COMPANY.

The eighth ordinary general meeting was held on Wednesday, at the London Tavern,—Major H. JELF-SHARP in the chair.

Mr. J. E. DAWSON read the notice convening the meeting.

The directors, in their report, stated that the shareholders were aware that since June, 1872, the operations had been confined chiefly to proving whether the lode in the Bahu would warrant the erection of stamping machinery at the mouth of the mine. Under date of Jan. 22 Capt. Dale's assurances on this head were circulated to the proprietors on March 8 last, and briefly stated the present prospects of the company as follows:—Sufficient ground had already been opened up in the Bahu Mine to enable ore raising to be resumed, as soon as the stamps were ready, without impeding or overtaking the works for developing the mine in depth. The stoping ground laid open would, Capt. Dale estimated, admit of the mine being worked at a profit, and by the time the stamps were completed there would be twelve months' ground opened out "in reserve," to maintain which the shaft and levels would be pushed on with all speed, simultaneously with raising ore for produce. Although Captain Dale estimated the present capabilities of the mine at 500*l.* per month profit, it would, of course, be apparent that as the lode opened out in depth more points could be worked at one time; and, presuming that the lode maintained its present size, a large amount of stone should be raised, and consequently increased returns and profits obtained. The directors could not but attach the highest importance to the favourable feature demonstrated by the last few months' working—that the lode in depth was improving in size, whilst it maintained its auriferous character. Instructions had been given for the erection of the stamping machinery at the mouth of the Bahu Mine, which work was now in hand; and under date April 16 Capt. Dale stated that he thought there would be no occasion to exceed his estimate as to time in its erection—by about August next. The Cachoeira Mine had not turned out so well as the Bahu, but the lode being now laid open could, in Capt. Dale's opinion, be worked at a profit, whilst the ground met with in the 20 east fully warranted the further development of this portion of the property. Other portions of the estate, such as the second and third formations, where lodes of large dimensions existed, offered an excellent field for exploration at some future date, but these had been, and were still, of necessity in abeyance. The directors considered that they had now good grounds for congratulating the proprietors on the prospects of the company, having every reason to believe, from the reports received, that in a few months returns of gold would be obtained, which would enable profits to be made and maintained.

The CHAIRMAN said he occupied the chair on the present occasion in the absence of Mr. S. Lloyd Foster (the Chairman of the company), who had been peremptorily summoned to attend a trial at one of the courts of law. He went on to say that he had himself only lately been appointed a director, although he had long been a shareholder. He fully concurred in the report, and certainly his own feeling and impression was that the shareholders might now look forward to something more like prosperity. As he had said, he had been a long time a shareholder, and he had better hopes of the concern than he had ever had before. The report of the directors was so full that he could add but little to it; but he should be happy to answer any questions which might be put. The directors had reason to believe that the stamps which were now being erected would be at work in four or five months, and he hoped and believed that gold would then be produced which would considerably more than cover the expenses. He then moved the adoption of the report and accounts.——Mr. W. HAYMEN seconded the resolution.

Mr. RECKETT asked whether the attention of the directors had been called to a paragraph in Capt. Burton's work, entitled "Explorations in the Highlands of Brazil;"—"This mining property had long been in the market for 100*l.* without finding a purchaser. Presently a gentleman at Rio de Janeiro disposed of it for 22,000*l.* (11,000*l.* in cash, and 2200 shares of 5*l.* each, fully paid-up) to the Rossa Grande Brazilian Gold Mining Company (Limited), the capital being 100,000*l.*" Amongst other things, also, it says—"According to the prospectus the land extends on both sides of the Serra do Socorro, and thus it has, or is said to have, a rivulet at its disposal." He thought the shareholders ought to have some further information on that point.

The CHAIRMAN said that none of the present directors were on the board at the time of the formation of the company, and could not well be acquainted with the circumstance to which attention had been drawn. He himself had never heard of it before; but if the shareholders wished it the directors would communicate with Capt. Burton on the subject, and ask for an explanation.

Mr. JOHN E. DAWSON said he could give no information, as he was not a director at the formation of the company. He had read Capt. Burton's work, but did not attach the same importance to the paragraph which the hon. shareholder seemed to do. When he was out in Brazil he took a copy of Capt. Burton's work with him, and had read the remarks which had been alluded to, and his own impression was that Captain Burton obtained his information from some person who had a very strong animosity to Captain Thomas Treloar. He did not believe there was the slightest truth in the statement made by Capt. Burton in respect to the formation of the company.

A SHAREHOLDER thought the expenses had been very high.

The CHAIRMAN said that they would be less in future, as the directors had decided not to take any fees till the company was in a dividend-paying condition, and this would effect a saving of 430*l.* a year.

Mr. BURRIDGE thought it was advisable to remove the offices of the company from the present premises. Referring to Mr. Henry Haymen, he said he believed that no director had felt more keenly than that gentleman the disappointment of the shareholders. He also objected to Mr. Dawson as the managing director.

The CHAIRMAN said he had only known Mr. Dawson since he had been a director, and he could only say that Mr. Dawson was a most efficient officer, and was, in his opinion, the right man in the right place.

The CHAIRMAN, in answer to a question, said he believed that only one more call of 1*s.* per share would be required, and most of that would be required to pay for the new stamping machinery. After some further unimportant discussion the resolution for the adoption of the report was put and carried.

The retiring directors, Mr. S. Lloyd Foster and Mr. John E. Dawson, were re-elected, and a unanimous wish was expressed that Mr. W. Haymen, who had tendered his resignation, should retain his seat at the board.

Messrs. Cash and Edwards were re-appointed auditors.

A vote of thanks to the chairman and directors closed the proceedings.

ST. AGNES CONSOLS MINING COMPANY.

The general meeting of shareholders was held at the mine on Thursday, May 29.—Mr. JOHN B. REYNOLDS in the chair.

The balance-sheet showed that the whole of the capital had been subscribed, and that the arrears of call amounted to 18*l.* The gross outlay up to April 30, including cost of labour, materials, engine, boiler, buildings, management, rent, dues, interest, &c., amounted to 6150*l.* 19*s.* 6*d.*; less proceeds of tin sold amount to 825*l.* 13*s.* 5*d.* The uncalled capital amounted to 5869*l.* 10*s.*, and the capital uncalled and unexpended amounted to 3869*l.* 13*s.* 11*d.* The directors' report was of a very favourable character, and set forth various anticipated reductions in expenditure, and under the head of "The Labour, Coal and Iron Questions" the directors say that no difficulty whatever has arisen in consequence of the scarcity of labourers, and the high price of materials. All engaged on the works have most cheerfully kept to duty to the full satisfaction of the agents, and the directors anticipate no difficulty whatever in the future. The quantity of coal consumed has not been considerable. The directors are fully alive to the importance of sinking the shaft with all practicable dispatch, and have constantly kept that object in view, and whilst economy has been observed no expense has been spared that could advance the interests of the company. With regard to "the Future Prospects," it was stated that, in consequence of the Wheal Rock lode proving more productive than was anticipated, the immediate prospect before the company is better than the directors had a right to anticipate at the outset; and should the Wheal Rock lode be cut at the 48 as much better as the lode in the 36 had improved upon the previous level, it is fair to expect that the mine will before long be more than paying its ordinary expenses. The directors have caused a survey to be made, in order to ascertain the relation of the property to that of Wheal Kitty, the result of which must be highly satisfactory to the shareholders; and it will be observed that at the 60 fm. level two lodes will be wrought upon from the present shaft. In conclusion, the directors feel it right to state that this is not an adventure of an ordinary character, and to remind the shareholders that any information will be cheerfully afforded from time to time by the secretary.

The report of the managers was of a highly gratifying description, and indicated the vigorous manner in which the works had been prosecuted. The balance-sheet and directors' report were unanimously adopted, and the retiring director—Mr.

Henry Vaughan—was re-elected, as was also Mr. Henry Swaffield, the auditor. The meeting terminated with a vote of thanks to the Chairman for his constant attention to the interests of the company, and for his courteous conduct in the chair. After the meeting the shareholders visited the different parts of the mine, and expressed themselves highly pleased with the property, and with the manner in which the works were conducted. The meeting was well attended, several shareholders having come considerable distances to see the property, which promises to rank amongst the first in Cornwall.

GENERAL MINING COMPANY FOR IRELAND.

The half-yearly general meeting of shareholders and directors of this company was held at the offices, Westmoreland-street, Dublin, on Monday,

Mr. R. FAYLE (Chairman of the company) presided.

Mr. THOMAS BAKER (the secretary) read the following report:—The directors have to report that, since the last meeting, the boiler of the pumping engine has been efficiently repaired. When this was done the water was again pumped out of the mine, and the different levels cleared from the runs which had taken place preliminary to the mine being submitted to the inspection of probable purchasers. As the expense of keeping the water out was very great, it was considered advisable to take advantage of the opportunity to test the indications for lead and for calamine, particularly referred to in the last report, and some work has been done in that way, but not enough to fully prove the points. The mine has been inspected upon two occasions on behalf of a gentleman who, the directors thought, might be disposed to take the working of it into his own hands. A communication just received, however, gives it as his opinion that the undertaking is too large for an individual enterprise, and could be better worked by a public company. The directors will immediately open communications with a view to making a satisfactory sale of the property, and they will hold themselves open to recommend to you at the proper time, if necessary, the acceptance of a portion of the purchase-money in fully paid-up shares in a new company to be formed for the purpose of taking over the working of the mine and the zinc manufacture, and of prosecuting both vigorously, if the terms offered are suitable. The increased value of the rich calamine is very favourable to the directors' efforts, and they have recently made some sales of ore of a percentage previously entirely unsaleable, which lead them to hope that a demand for this quality has arisen which will afford a profitable outlet for a quantity of it. Pending negociations for the sale, the costly pumping operations will be discontinued, and the outlay stopped. The manufacture of zinc oxide has been seriously interfered with during the half-year by want of fuel. For more than three months the furnaces were idle, while the vessels with culm on board were weatherbound at the shipping port. The spring farming work afterwards interfered with the transport of the culm to the works, a difficulty which the circumstances of the company did not permit the directors to remedy by any course involving capital outlay; and, in addition to the difficulty of getting supplies of fuel, the first cost and the freight during the half-year were greatly in excess of any previous period. To meet the extra cost thus incurred, the directors had to put up the price of the zinc oxide, and as the demand for the article continues to tax the company's powers of production, the directors look upon the manufacture as being now sufficiently well established to justify the purchasers in greatly extending the works. The directors think it right to explain that the amount set down in the accounts as the bank debt includes a sum of 1000*l.* owing to the company by the Shallee Silver-Lead Mining Company, the bills given for which were discounted with the Hibernian Bank, and as they fell due were charged against this company's account, two-thirds this half-year, and one-third in the previous half-year. The directors look upon this debt of the Shallee Company's as being perfectly secure. The directors are aware that the board of the Shallee Company have been and still are making efforts to have the property worked in a manner commensurate with its importance, and whatever assistance the directors, as representing the company's large interest in the concern, wholly irrespective of the 1000*l.* debt above referred to could give to their efforts has been, and will continue to be, willingly accorded. The directors have to announce with pleasure the accession to the board of Dr. Studdert, who has devoted much time and attention to the interests of the company since he became a director. The directors beg to refer to the accompanying report of Mr. H. W. Roberts as to the operations at the calamine mine and zinc oxide works and the condition of the machinery and plant at Silvermines, and also to the accompanying report of an inspection of the mine recently made by Mr. William G. Roberts.

Llanberis, North Wales, May 29.—After the meeting held on Dec. 2, 1872, according to instructions, we commenced repairing the boiler-tube, re-setting the boiler, and erecting the house, all of which were necessary to re-pump the water out of the mine. Immediately the above work and the clearing of some adit shafts were accomplished we commenced to pump out the water, in which undertaking we were almost successful, owing to the pitwork being in good order when the accident occurred. The operations underground were chiefly confined to clearing some levels which had given way from the rising of the water, for which reason we were unable to make any extensive trials, even in the two interesting points mentioned in Capt. Roberts' report of the previous half year; but while the water was being kept out of the mine to allow it to be inspected we extended some fathoms in the 21 fathom level in both northerly and westerly directions, the ground continuing to yield some ore, and looking promising. It is composed of calamine ore, ochre, and some boulders of dolomite. The 23 fm. level east was also extended in a northerly direction through very favourable ground, with silicate of zinc and some lead, and in a north-easterly direction some very good lead and blende, with sulphur ore, were met with through the dolomitic limestone. We have recently driven easterly on the lode, and found it composed of lead, blende, and calamine ores, mixed with oxide of iron and sulphur ore.—Oxide Works: The yield in this department has not been up to the average, owing to the lower percentage of the ore, and also to the fact that we were idle for a very long time in the commencement of the half-year for supplies of coal. If the raisings from the mine had been going on a much better ore would have been got for making with the ore on the surface a suitable mixture for the furnace. The article manufactured has been of a superior quality, and I hope by constant working and a supply of coal we shall be enabled to give a more satisfactory return next half-year. The engines, furnaces, flues, chambers, pans, and all the machinery are in good working order.—H. W. ROBERTS.

In accordance with the desire of the directors, I have just visited the mine and works at Silvermines, and examined every point of interest. At the calamine deposit the same general character prevails throughout as described in my report of Nov. 19 last. Several fathoms of ground have been opened at the 23 fm. level, the lode continuing to yield a mixture of calamine, lead, and blende, and is of a very promising character. A vein of mixed blende, lead, and sulphur ore, from a few inches to a foot or more in width, has been discovered, resting upon the dolomite, having a south-east and north westerly strike, and may lead to a more regular and productive lode. I suggested that a few fathoms should be opened easterly upon it, and this work was at once commenced. This part of the mine continues to present very encouraging prospects, and I am quite of the opinion if it is developed that large masses of mineral will be discovered. There has not been much done in the other parts of the mine since the water was pumped out, and there is no new feature to report upon. If it should be found desirable, there is no doubt large quantities of low percentage mineral can be raised at any time. The repairing of the boiler, and the several improvements made in the building of the flues, &c., has effected a very considerable economy in the consumption of fuel, and would soon pay for itself if the mine is worked. The zinc oxide works are in full operation and right good repair.—W. G. ROBERTS.

The CHAIRMAN moved the adoption of the report, and said the simple matter now was to find the best purchasers. The directors saw no reason to recommend any other course, for the time had come when they ought to try and close the affair. A gentleman had been in negociation about the purchase, but nothing definite had yet been arrived at.

Mr. D'ARCY, as one of the largest proprietors, suggested that if the sale referred to was not carried out the mine ought to be put up to public auction, as there was no use in the company continuing the outlay without any return.——The CHAIRMAN said they would do so, and that in the event of the gentleman whom he had referred to not purchasing the property would be extensively advertised in all the mining papers of England.

After some desultory conversation, the report was adopted, having been seconded by Mr. NOLAN.

The CHAIRMAN, in reply to a shareholder, said the present call when got in, and the other assets, would more than pay all the debts of the company.

Mr. FLOWER said he saw in the statement of accounts an item of 164*l.* 14*s.* 9*d.* for directors' fees. He understood the directors were not to receive any fees while the company was not paying a dividend.

The meeting separated, having proposed a vote of thanks to the Chairman, Dr. STUDERT having been called to the second chair.

WEST GWENNAP CONSOLS.—A meeting of adventurers was held at the London offices, Mr. Wm. Carpenter in the chair. At the last meeting 434*l.* stood to the credit of the mine, and four months' working reduced this to 344*l.* The accounts were passed, and it was resolved "That the balance of the call of 5*l.*—2*l.* 10*s.* a share—be paid to the secretary on or before June 11." The meeting also empowered the committee to purchase an engine. The report of the manager of the mine, Mr. John Nancarrow, stated that the work of clearing, repairing, &c., had proceeded without intermission, and with especial reference to the south part of the south district, where another shaft, 45 fathoms south of the great tin lode, had been cleared in order to secure the most difficult part of the adit. The surface erections were found to be in a very dilapidated state, but they were now one of the best lots of mine buildings in the county. Five shafts were cleared and repaired to the adit level, each a depth of 30 to 35 fathoms; four of these were put in order for drawing, and a whim erected on each, and in the other a ladder-way was fixed. The adit level was cleared and repaired in its west and south branches for upwards of a mile in length. Various other clearings and repairs, extending over some hundreds of fathoms, were done at the adit level, including all the levels on the great tin lode and the south lode. The former was by far the most important of all the lodes hitherto seen. There were two apparently distinct runs of tin, containing a great mass of tinstuff, which presented the best prospect of paying well, but to which, in order to its proper development, pumping power must be applied. There was a fine piece of unexplored ground on this lode westward, into which an end was now being driven, and which, from its position being parallel with other rich lodes, was likely to prove very valuable. Capt. Nancarrow recommended the sinking of an engine-shaft and the purchase of an engine of 60 in. cylinder. He stated that he has the greatest confidence in the success of the undertaking.

WHEAL BASSET.—The two-monthly meeting was held at the mine on Tuesday, under the presidency of Mr. Roseveare, Rosewarne. The accounts for eight weeks ending April 8 show a credit balance of 537*l.* This, with extras, made a profit on the two months' working of 483*l.*, leaving a balance against the adventurers of 1408*l.*—Mr. Harris enquired if all the tin credited had been sold?—The purser (Mr. G. A. Michell) answered that about 10 tons remained unsold; but, as the cost had been paid on it, they considered themselves justified in placing it to the credit of the mine.—A question having been mooted as to the desirability of making a call, Capt. Trevena said he should be opposed to such a measure, as with their present prospects there was no doubt but that the mine would pay off its own debts very shortly. Appended are extracts from the agent's report, signed by Capt. W. C. Trevena, W. H. Pascoe, John Opie, and Wm. Reynolds:—Great Lode: The 112 west of Richards's shaft, is worth for tin 7*l.* per fm. We have five stopes working on this lode, worth on an average 8*l.* 8*s.* per fathom; stoping at 30*s.* per fathom. The 75 fm. level, east of Sampson's shaft, is worth for tin 8*l.* per fathom; driving at 10*l.* per fathom. There are seven stopes being worked on the Carbona, worth on an average 11*l.* 8*s.* per fathom, stoping at 4*l.* 8*s.* per fathom.—Theaker's Ore Branch: The winze sinking below the 40, west of cross-cut, is worth for copper ore 5*l.* per fathom; sinking at 3*l.* 10*s.* per fathom and 8*s.* tribute. In the tribute department we have pitches working on copper from 6*s.* 8*d.* to 13*s.* 4*d.* in 1*l.*, and on tin from 7*s.* to 15*s.* in 1*l.* We are pleased to tell you the mine continues to open up well, and during the past two months we have been enabled to considerably increase our returns. Yet the fall in the tin standards has made a difference of about 400*l.*, which, combined with the high price of all materials and increased cost of labour, considerably tells against the profit of the adventurers.

EAST BASSET.—The adjourned meeting was held at the mine on Tuesday, when Mr. Wm. Shilson presided, and stated that the meeting had been convened for the purpose of considering the resolution passed at the last general meeting, "To consider the position of the mine, and to pass such resolutions as might be deemed necessary." Capt. Rich. Pryor thought the meeting should have been held elsewhere, but the feeling of those present was against him. He then went on to say that it was high time to take some steps when one man said the bottom of the mine was not worth anything, and another expressed his opinion that it was as poor as death. He moved "That this special meeting be adjourned to June 13, to be then held at the office of Mr. H. L. Phillips, St. Michael's-alley, Cornhill, to consider the position of the mine, and that the purser be requested to attend the meeting, bringing with him the cost-book, share-ledger, and transfer-book." The purser (Mr. S. Abbott) suggested that another day should be selected, as the day named was the one before their pay-day. Capt. R. Pryor said that as the proposition did not emanate from him, but from the outside shareholders, he had no power to alter the date. The Chairman did not see why the meeting should be held out of the county. Capt. Pryor replied that the greater portion of East Basset shareholders lived out of the county, and he thought it was nothing more than fair that they should attend the meeting. The proposition of Capt. Pryor having been put, it was carried unanimously, and the meeting soon afterwards separated.

WHEAL VINCENT.—The quarterly meeting was held at Golding's Hotel, Callington, on Friday, when Mr. E. Nicholls, the purser, presided. The accounts showed an expenditure of 2313*l.* (including the balance against the mine at the last meeting), the receipts were 1050*l.* amount of call, and about 780*l.* for 10 tons 14 cwts. of tin, leaving a balance of about 487*l.* against the mine. To meet this a call of 2*s.* 6*d.* per share was made. The agents reported that a considerable amount of work had been done in preparing and sinking the engine-shaft and other operations on the mine, which may account for less tin being sold during the last three months than the three months previous. The agents said that they were driving to cut the streamers lode, commonly called the rich lode, which was reported to be very good, and they would cut it in about a month's time. During the winter the ground was so soft that they could not work it. Some of the shareholders seemed rather disappointed because Vincent was not a dividend-paying mine, and although the engine had been working for nine months they were still obliged to pay calls. It was mentioned that there were not many young mines that have sold more than 38 tons of tin, realising nearly 3000*l.*, within so short a period of time.—*Western Morning News.*

[For remainder of Meetings see to-day's Journal.]

FOREIGN MINES.

ST. JOHN DEL REY.—Morro Velho, May 1: Sinking of shafts for April: A sunk 3 fms. 2 ft. 2 in., total depth 157 fms. 0 ft. 10 in.: B sunk 4 fms. 1 ft. 6 in., total depth 156 fms. 0 ft. 10 in. Total depth for the month 7 fms. 3 ft. 8 in. A shaft has passed through the cracked rock met with upwards, and is at the sump at present in solid rock. B shaft is also in solid rock.

PORT PHILLIP AND COLONIAL (Gold).—Telegram, dated Melbourne, May 29:—"Month ending May 21—yield per ton, 4 dwts. 10 grs. Shaft reached No. 9 level, making a total depth of 790 ft."

EBERHARDT AND AURORA.—Telegram from Capt. Drake:—"1167 tons worked during May. Average assay, $58; the produce, $55,047; expenses, $40,500; profit, $14,547. The expenses include the cost for a large quantity of ore that has been mined, assorted, and conveyed to the dumps of the mill."

THORNHILL REEF.—Telegram from Mr. Salter, the company's superintendent in Australia:—"Crushed altogether from the three levels 560 tons—380 ozs. gold."

ARUBA (Gold).—The last mail from St. Thomas brought to the company a full and detailed report from their new superintendent, Mr. Newman, formerly manager of the Black Hill Gold Mining Company, at Ballarat, Australia, fully confirmatory of all previous reports furnished the company by Mr. Frank Taylor, Mr. Randall, and Mr. Benjamin F. Rule. Mr. Newman says the company have a large amount of quartz on the surface ready for treatment as soon as the mills are complete, which will be during the month of July. He concludes his report by saying that the company has a very valuable property. Monthly returns of gold shipments may be expected regularly from and after August.

FRONTINO AND BOLIVIA.—The directors have advices (April 12) accompanied by the usual accounts, and a remittance of gold valued at 1248*l.* 13*s.*, the produce of the mines for March last. The following are the accounts:—Produce: 540½ ozs. from 1860 tons of mineral (average yield per ton, 5 dwts. 19 grs.), 1248*l.* 13*s.* Cost: at Frontino and Bolivia Mines, and expenses in London and Medellin, 1146*l.* 17*s.* 6*d.*: showing profit, 101*l.* 15*s.* 6*d.*

RICHMOND CONSOLIDATED.—Cablegram from the mine: Hall, London. Last week's run, 330,000.—PROBERT.

CRESENT (Gold).—Capt. Stetson, May 4: The shaft I wrote you I was sinking 900 ft. west of the hoisting works is now down 6 ft. in the bed rock, and I have started to drift north and south to cut the ledges. In sinking I found some very rich float rock, which gives me better hopes of getting a good ledge in that quarter. The ledge I wrote you of cutting 40 ft. south of the pit is thus far only $3 ore; the ledge is 3 ft. thick, and I am drifting east and west on the same. I am now in 52 ft. on the 3d level of the crescent; the rock has been hard during the past week, but it is better to work now; we have no ore from that quarter yet that will pay to work. I have started to drift on one of these ledges that have been struck in the cross-cut running from the Pet to the 2d level of the Horse-shoe; it shows gol l often, but seems better on the top than at the bottom. I shall rise on it for a short time, to determine whether there is anything worth going after there.

I. X. L. (Gold and Silver).—L. Chalmers, May 12: The ore dump is full ready for the tram to haul away, and I cannot get more on it until this is removed; the ore will be of low grade, but will pay to work. The dumps have been picked over by the late owners for the best ore, but they have left ore which they could not work with the means at their command, but which I shall have run through, and report results. Only 5½ feet of shaft last week.

— May 14: In reply to your letter of April 21, just received, I cannot say whether or not stoping in the 200 ft. level will produce ore enough to run a 20-stamp or a 40-stamp mill, but, as I have already advised the board, I am about to experiment on some low grade ore. Should this batch pay to mill I have already ore in sight to run a 20-ton mill a year at least. I have stated in a former letter that experiments with the I. X. L. ore can alone solve the problem—a very important one so far as dividends are concerned—whether the wet or dry process will suit best. When I have run 100 tons or so through I shall report fully. From a survey just made I find I shall have to run from 40 to 60 ft. further before we strike the I. X. L. ledge in the 100 ft. level. What we did strike, and which I reported on as very much broken up where we cut it, was the estimate. My foreman, an experienced Grass Valley and Cornish miner, is very confident that we have a grand mine; so are all the miners who have come from Grass Valley. Residents are also of the same opinion.

EXCHEQUER (Gold and Silver).—L. Chalmers, May 12: The dump is full of ore, waiting the team, which will be here on Friday or Saturday. I shall commence hauling on Monday, the road will be in good order by that time. The mill is still unfinished, and I am afraid will take a fortnight yet. The carpenters are now flooring the ore-house. The shaft still makes slow progress—only 4 ft.; but you must remember that 4 ft. of a shaft means an excavation in wet and hard rock of 11 ft. by 6 ft. 6 in.=11 ft. of tunnel, the shaft being 9 ft. by 4 ft. 6 in. in the clear, the additional space being required for timbers.

SILVER PLUME.—Mr. T. Orchard, having returned to England, has made a report upon the property, which has caused an impression upon the minds of the directors that although the mine has not justified the expectations originally entertained of very large and immediate returns of rich ore, there is yet no reason to doubt that the shareholders are in possession of a very rich mine, being a true fissure vein, and that from the lower levels now reached, large quantities of silver-lead ore may be extracted with facility, and that the property will soon become very remunerative. As a proof of their confidence in this opinion, they will be prepared individually to take up their quota of the new capital, provided that the other shareholders will do the same. But unless the shareholders will do this, sufficient funds cannot be raised to pay off the liabilities, and provide the working capital required for development; and there will be no alternative but to wind-up the company's affairs, and submit to a total loss of the capital embarked in this enterprise.

GOLD RUN (Hydraulic).—The superintendent (Mr. Kipp) writes under date, May 1: I have had many unforseen difficulties to overcome since the season opened. I feel confident that I have exercised the best possible judgment in the management of the mine. Very true, I could have made at least two runs since the water commenced flowing in the ditches, but it would have been a detriment to the mine, also the returns would have been light. I could not think of operating a hydraulic when the water would freeze in the sluice. Since I have got to running regularly, and working in high bank, I have had a great deal of pipe clay to move; for instance, this stratum of clay is 5 ft. thick on the surface level. The storms of the two past seasons had caused so much of it to cave down directly in front of workings that it took much time to move it off. We have now got up to main bank (120 ft. of fine looking gravel), and shall continually wash so long as water lasts. The sluices look well; I have no reason to doubt a good clean up. I consider at this date all difficulties surmounted. I am now running on back line towards the Sherman ground. It will take me two long runs before reaching the Sherman line. The present depth of shaft is 90 ft. in a fine blue gravel, soft all the way down. At 86 ft. the gravel changed to fine quartz pebbles, very lively looking dirt. The prospect was good for hydraulic dirt all the way down to 86 ft.; there the dirt became much richer and continued to improve as we went down. The miners here consider the last 4 ft. of dirt worth $500 per day with hydraulic process. It would not pay to drift and crush, but certainly it is very encouraging, so much so that I feel justified in going to the additional expense of machinery. This shaft has already developed the property at least 10 times its first cost, and I candidly believe that when I get to bed rock I shall be able to cable you intelligence of very rich drift diggings. Everything now looks favourable for the future. Our water power and hoisting works are to be completed and in running order by the 8th of this month. I shall drive the work ahead, and think we shall get to the bottom before 30 days thereafter. I cabled the full net of hydraulic clean up, and deposited same in Californian Bank, less $1000 for shaft work, which will be credited to hydraulic claim and charged to shaft account.

BUNTER HILL (California).—W. L. Palmer, May 12: We have an abundance of rich ore. The body of ore in the 170 has increased since my last. As the drift has been run south the stoping parties have worked up to a height of some 40 ft., and the highest stoping parties are about 50 ft. north of the end of the drift; at that most northerly point they have discovered another and important independent body of ore going north from that point, it is over 3 ft. thick, and of most excellent quality. We are 8 ft. in the lode in the 270, and it still continues good and strong. We are running the mill with profit by water, and should water fail as the season advances we shall be ready to run by steam.

PONTGIBAUD.—W. H. Rickard, June 2: Roure: The ground in the engine shaft continues favourable. The rise in the back of the 60, under this shaft, is hard and sparey. The 100 cross-cut east continues without change.—Virginie's Lode: The 80 metre level north is unproductive. The 60 north yields a little saving work, and the rise behind this end yields ¾ ton of ore per current metre. The 60 south yields ½ ton per metre. The 40 south yields a little saving work, but the same level north is unproductive. The 20 metre level south yields ¼ ton of ore per metre. The rise behind this end is holed to the winze below the adit level, and has laid open a good piece of tribute ground. The 20 metre level north yields stones of ore; we have set a rise behind this end, which is unproductive. The adit north yields ½ ton of ore per metre.—Mill Lode: The adit south yields stones of ore, and the lode is large and kindly. Our tribute pitches throughout the mine yield very fairly.—La Grange: The 100 metre level, north of Nosky's shaft, on the western part of the lode, yields ¼ ton of ore per metre; but the same level, on the eastern part, is unproductive. The tribute pitches are, on the whole, fallen off in value.—La Brousse: The 140 cross-cut, east of Basset's shaft, continues hard. The 120 metre level south yields coarse saving work. The lode, where being undercut behind this end, yields ¾ ton of ore per current metre. The 100 south yields 1¼ ton per metre. The 80 yields a little saving work. The winze behind this end yields ½ ton of ore per metre. The winze below the 60 yields ¼ ton per metre. The 20 metre level, on the eastern part of the lode, yields ½ ton of ore per metre. Our stopes and tribute pitches are, on the whole, producing well.—Pranal: The 70 metre level south is unproductive. The same level, south of winze, yields ½ ton per metre. The 70 north yields ¼ ton per metre. The winze below the 50 is holed to the 70, opening a good piece of tribute ground. The 50 metre level, north of St. George's shaft, produces occasional stones of lead ore and blende. The 8 cross-cut west continues in hard ground.—Surface: Our new works have gone on steadily at Pranal and Roure; at the latter place we have got the walls of the new engine-house up out of the foundation, and have now suspended it to take down John's engine-house, out of which the machinery is taken. Our dressing has gone on regularly, and the samplings have amounted to 263 tons.—St. Amant: The sinking of Susan's shaft below the 25 metre level goes on regularly, but the ground continues hard and wet. The 25 metre level north yields occasional stones of ore. The No. 2 winze below this level is in a strong, kindly lode, yielding a little saving work.

WEST CANADA.—May 4: Huron Copper Bay.—The stope in the back of the 60, east of Bray's shaft, will yield 2 tons of ore per fathom. In the bottom of the 35, east of this shaft, the stope is yielding 2½ tons per fathom, and the stope in the bottom of the 35, west of Palmer's shaft, 5 tons per fathom.

[For remainder of Foreign Mines see to-day's Journal.]

FLAGSTAFF, LAST CHANCE, AND EMMA NEW MINING MAP.—An admirably lithographed map on a large scale, 32 in. by 24 in., of Emma Hill and the Little Cottonwood mining district generally, has just been published by Col. B. A. M. Froiseth, the well-known mineral surveyor, of Salt Lake City, to whom we are frequently indebted for very valuable communications, and is now being issued (price 12s.) in this country by Messrs. Trübner and Co., of Ludgate Hill. From the large amount of British capital invested in the district represented on the map it is but fair to assume that it will be very generally consulted by many persons in Great Britain, especially those connected with the Emma, Last Chance, and Flagstaff Companies, since the Emma Hill occupies almost the centre of the map, and from the striking colours used in the indication of the locations any particular information sought can be obtained in an instant. The physical character of the district is very prominently shown, and as the map embraces nearly 400 mining claims and tunnel locations it is obvious that the interests of a large number of shareholders will be touched up. The data upon which the map has been compiled are in every way satisfactory—both official and private surveys having been availed of, and additional value is given to it by using distinctive colours for the claims which have been secured by United States Patents. The map has been carefully lithographed by Osborne's process by the American Lithographic Company, of New York; and as its accuracy is certified by Mr. C. C. Clements, the United States Surveyor-General for the district, it may be consulted by shareholders or intending investors with the utmost confidence.

MINERAL WEALTH OF NEW MEXICO.—SILVER CITY is the centre of a section of country about 100 miles square, in all parts of which discoveries of metals, from gold down to iron, have been made. It lies in the Sierra Madre range—the same in which the old mines of Mexico exist, still yielding almost fabulous amounts, though worked in a very crude and unsystematic way. Some of the silver mines of this locality are believed to be huge deposits, while others show true fissure veins. The grade of much of the ore is very high, some yielding as high as $4000 to the ton, and none is worked that does not run as high as $60 or $75 per ton. Then there are millions upon millions of low-grade ore, which will run from $20 to $60 to the ton. A few miles to the north are the famous Pinos Altos placers, which are rich in gold, but lack water for workings; there are also rich and well-defined true fissure vein of both gold and silver, which are more or less worked, some to the depth of 100 ft. Lone Mountain district is about 9 miles east of this place, and contains many mines of great richness, nearly all the ore from which shows pure horn-silver. The disadvantage under which this place is labouring is the lack of milling facilities, or means of reducing the ore. About 15 miles north-east of Silver City is the renowned Santo Rite Copper Mine, which has been worked for many years, yielding ore so rich in copper and gold as to make it profitable to pack it on mules to the coast—a distance of 1000 miles—thence ship to Europe for separation. Cheaper transportation will be furnished upon the completion of the Texas Pacific Railway. In the same vicinity are the Hanover and San Jose copper mines, and also an iron mountain, from which ore has been taken sufficiently pure to be hammered out without smelting. To the westward are the Burro mountains, which are almost a mass of ore—gold, silver, and copper all being found there. Ralston, just west of these mountains, is another place where millions of tons of rich silver ore exist, but cannot at present be obtained for lack of wood and water. In time a road will be built from these mines to the Gila river, a distance of 25 miles, over which the ore will be transported to the splendid water-powers on this river, where it may be profitably worked. Among other discoveries made in this vicinity may be enumerated kaolin, fire-clay, and a vein of very fine white marble. Good indications of coal exist, and the early discovery of this material is confidently expected. Settlement in this country has been greatly retarded by the hostility of the Indians; but Cochise, the great chief of the Apaches, having made peace, and his people having gone on their reservations in Arizona, it is believed there will be little further difficulty of the kind, although it is still deemed advisable to travel in company and armed to insure freedom from molestation by roving outlaws whom the chiefs may not be able to control.—*Chicago Tribune.*

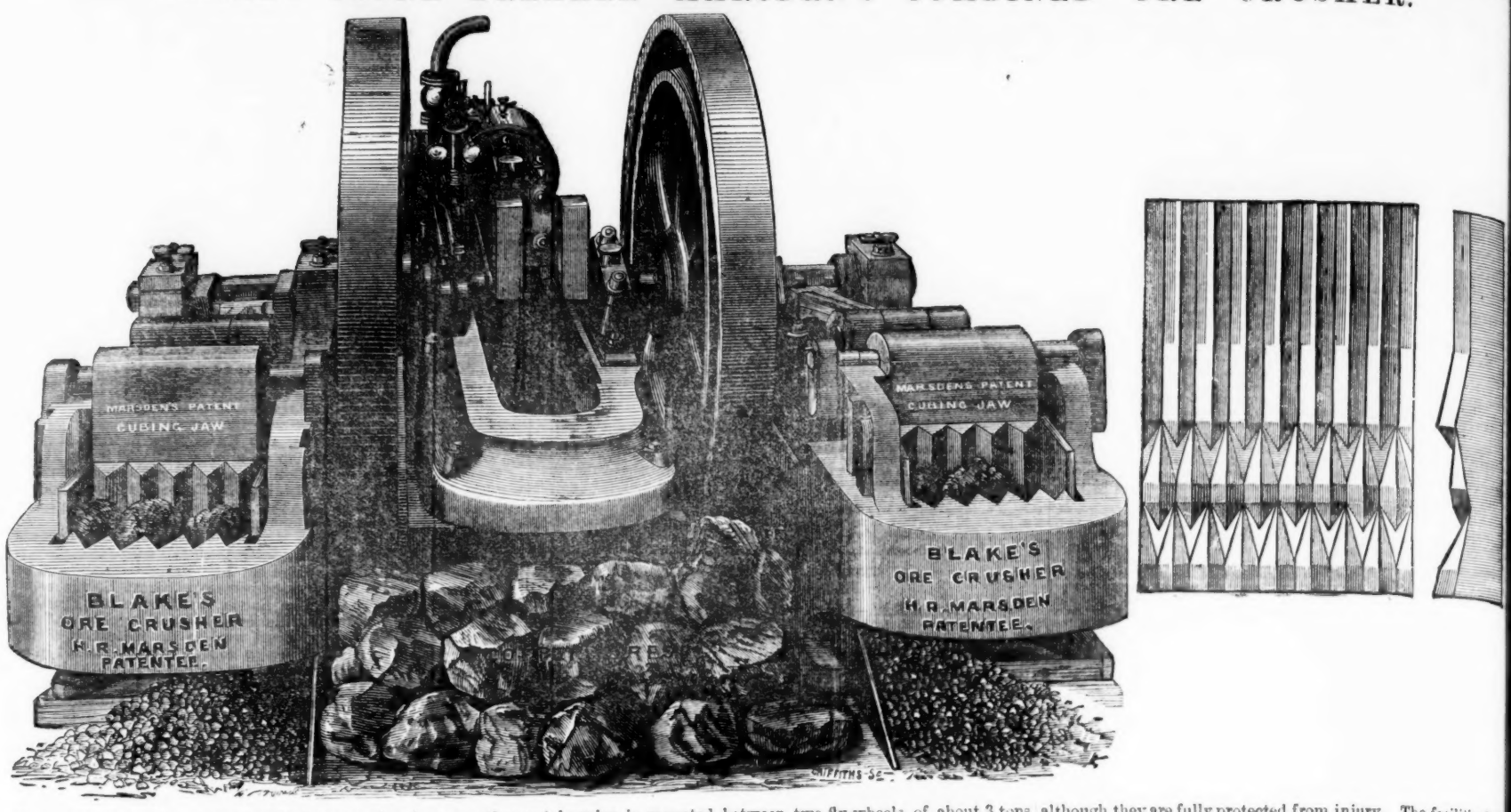
MINING ON THE PACIFIC COAST—LARGE DIVIDENDS.—People who doubt the permanence and richness of the Comstock lode, and who revile against mining operations on general principles, will doubtless be surprised at the dividends paid by the companies on this lode this month. The Crown Point Mine has declared a dividend of $10 per share, aggregating $1,000,000, the largest dividend ever paid by a mining company in one month on this coast, or elsewhere as far as we know. The Belcher's dividend of $8 per share, aggregating $832,000, is the next largest ever paid, both together amounting to $1,832,000 from these two mines for one month. The Eureka Mine has declared a dividend of $2 per share, equal to $40,000, and the Consolidated Amador will probably pay $1 per share, or $20,000, which will aggregate $1,858,000 for one month. The dividend of the Crown Point Mine is just double what it was in April, when $5 per share was declared, aggregating $500,000, which added to that of the Belcher for April amounted to $1,020,000. Moreover the surplus of the Belcher for April was $200,000, which added to the surplus on hand, makes about $1,000,000 carried over to be added to the production for the current month. As showing the relative increase in the amount of dividends, the following figures are interesting. During the year 1872 the amount disbursed by mining companies called on our stock board was $6,731,100; in 1871 the mining dividends were altogether only $4,837,850, showing an increase of $1,893,150. This increase occurred notwithstanding a number of prominent companies which paid dividends in 1871 paid none in 1872. This is exclusive of coal mining companies, our figures having to do only with gold and silver. Besides these, the Idaho Mine, at Grass Valley, not called in our Stock List, has just paid $20 per share, not taken into account. From these figures will be seen the great increase in amount of mining dividends this year. The amount for the first five months of 1873—some dividends for May not yet having been declared, moreover—exceeds the total dividends of 1871 by $427,231. The dividends thus far in 1873 being $5,265,181, and that of the total for 1871 being $4,837,950, leaving a difference in favour of these first five months of $427,231. It must be remembered, however, that these figures only represent the dividends of those mines dealt in at our Stock Board, a point always to be borne in mind. Thousands of mines scattered over the Pacific Coast pay out large sums to their owners of which the public hear nothing. Some of our heavy mining capitalists own these mines alone, or associated with one or two others, and as only private reports are made the figures are not made public. We know of a number of such instances. The hydraulic claims of our own State, owned by a few hard-working men, pay large sums monthly, which do not find their way into the statistics. An example of this is shown in the Spring Valley Canal and Mining Company, at Cherokee Flat, which turned out $50,000 in gold in April. Consequently people should not say "Mining does not pay," because they see in the papers that during 1872 only $6,731,100 was paid out as dividends, while the bullion production was $62,236,914. This money not only went into business channels, but supported many thousand men, and made fortunes for thousands more. *Mining and Scientific Press* (San Francisco), May 10.

MONSTER CAPE DIAMOND.—Messrs. Elkington and Co. are exhibiting at their show-rooms, in Liverpool, a monster uncut Cape diamond, which has been consigned for sale to Messrs. A. C. Stewart and Co., Cape merchants, of Liverpool.* Its value is estimated at 25,000*l.*, and it weighs 288½ carats, or 102 carats more than the Koh-i-noor in its rough state. It is 1⅝ in. long in one direction, 1½ in. in another, and 1⅛ in. in thickness; and, like all Cape diamonds, is of a decidedly yellow colour, resembling very much the diamond known as the "Grand Duke of Tuscany's," or "Austrian," which weighs 139½ carats. It has hitherto been excelled in weight by only four other diamond—"The King of Portugal's," weighing 1680 carats; "The Rajah of Mattan's," 367 carats; "The Nizam's," 340 carats; and the "Great Mogul's," 787½ carats. Had the gem been white its value would have been beyond calculation, but as it is it is valued at the very considerable sum named.

LONDON GENERAL OMNIBUS COMPANY.—Traffic returns for the week ending June 1, 11,002*l.* 6*s.* 7*d.*

HOLLOWAY'S PILLS AND OINTMENT—PREVENTION OF WEAKNESS.—Whenever circumstances produce impure blood, lessen the force or in any way disarrange the balance of circulation, stagnation takes place in the lungs, and consumption or other formidable symptoms discover themselves. Let Holloway's remedies be tried on the first feelings of debility, or on the first annoyance of a dry hacking cough. After the chest, both before and behind, has been fomented with warm brine, and the skin has been dried with a towel, the ointment should be well rubbed twice a day upon the chest and between the shoulders, and the pills should be taken in alterative doses, to purify the blood and cleanse the system, without weakening it, or rousing or aggravating nervous irritation.

BLAKE'S STONE BREAKER—MARSDEN'S COMBINED ORE CRUSHER.



The combined traction engine and Blake's stone-breaker, recently introduced by H. R. MARSDEN, of Soho Foundry, Leeds, was illustrated in the Supplement to the *Mining Journal* of May 17, and it is now proposed to show the Combined Ore-crusher with the Cubing-Jaw applied. The great advantage of this arrangement is that the machine is complete in itself, and that nothing more is required than to turn on the steam and feed in the ore to be operated upon. The compactness and simplicity of the double crusher will be readily seen from the annexed diagram, and the far greater economy of working can scarcely be doubted when it is considered that all belting and similar objectionable contrivances are dispensed with, and that the crank of the engine and the cranks of the stone-breakers are mere continuations of each other. The two stone-breakers are placed quite as closely together as would be practicable under any circumstances; yet the space between them is utilised by filling it with the engine and fly-wheels. Nor is the reduction of space the only advantage, for, as already explained, one foundation carries both the engine and crusher. The result is obvious: the first cost is less, the wear and tear is less, and the hindrance sometimes unavoidable when belting is used is altogether avoided. A very compact little horizontal engine is mounted between two fly-wheels, of about 3 tons weight, care being taken to keep the crank-shaft of the engine at whatever level it is proposed to have the crank-shafts of the stone-breakers. The engine and fly-wheels are then boxed in, and the portions of the crank-shaft which continue through the casing form the crank-shafts of the stone-breakers, and thus communicate motion to the jaws of the machines. With 56 lbs. of steam and an engine with a 14-in. cylinder and 20-in. stroke, Mr. Marsden finds no difficulty in running a pair of his breakers, taking in stones 15 in. by 7 in., and these working at their normal speed of 125 revolutions per minute will break down 18 tons per hour, which would prove ample for most mines; but should a still greater amount of work be required there is no inconvenience in increasing the speed of the engine, so as to make the production 22 tons per hour, and the cost is found not to exceed from 1¼d. to 2¼d. per ton, according to the superior arrangements for feeding the crushers and removing material crushed.

Although it has been learnt from experience that the amount of repairs required with Blake's stone-breaker is very small, it is essential in all machines that the possibility of accident should be provided against, and in this respect Mr. Marsden's combined ore-crusher leaves nothing to desire, since all the parts are very easy of access, although they are fully protected from injury. The facilities for regulating the size to which the material is to be broken are as perfect as the various other parts of the machine, so that no trouble is experienced in dealing with whatever kinds of ore the mine produces.

The precise form of the cubing jaw will be better understood from the smaller diagrams, showing the front and side view respectively, and for the production of work of nearly uniform size it is unsurpassed. It is simple, and consists in an extension of the lower end and giving a curved form backwards to the moveable jaw; thus, the orifice of delivery is made to terminate a parallel channel of some 3 or 4 in. in length, wherein the corrugations of the fixed and moveable jaws are so arranged as to alternate the one with the other—ridge against furrow, and *vice versa*, and the action of this jaw leaves little to be desired in regard to the evenness and regularity of the resulting sample of broken stone. As a machine capable of turning out 3 cubic yards of stone per hour, with only 4-horse power, can be obtained at a price which would represent a comparatively small amount of hand labour, it may fairly be hoped that the time is not far distant when no mine will be without a stone-breaker, which is really as necessary to the progress of any enterprise as any other piece of dressing machinery.

MECHANICAL VENTILATION OF MINES.

The best mode of ventilating mines is a subject well worthy the study of all persons engaged in mining operations, and it is of considerably more importance to the engineer having the charge of hundreds of lives, than any other. The great object to be obtained is a maximum amount of ventilation at the lowest cost. The problem is one to which many scientific individuals have of late years paid a great deal of attention, and in various parts of the kingdom the ordinary furnace mode of ventilation has been superseded by the fan. At Earl FITZWILLIAM'S collieries, at Elsecar, a powerful fan has been at work for several years, and there has been an entire absence of accidents at the place, which is a strong proof of its efficiency. The mechanical ventilation of mines was discussed a short time since at the meeting of the Derbyshire Mining and Mechanical Engineers, with special reference to some experiments made with the Waddle Fan at the High Park Colliery. Mr. MORRISON, who is agent for the Guibal Fan in this country, was present. That gentleman, however, is of opinion that the Guibal is by far the best ventilator yet produced, and in a paper read before the South Yorkshire Association, he pointed out its advantages. As to the best mode of ventilating mines which are very deep, Monsieur GUIBAL says that if they took a 12-feet shaft, 400 yards deep, through which there went 53,000 cubic feet of air per minute against a total resistance (including the friction of the shaft) represented by 3·3 in. water guage, with an average excess of temperature of 108° Fahr. in the upcast shaft, above the downcast shaft, to have a consumption of 31 pounds of coal per horse-power in the air, estimated on the total resistance; then, under the same conditions, a mechanical ventilator utilising 60 per cent. of the power employed, would consume 11 pounds of coal per hour per horse-power in the air, being a saving of 64 per cent. At a depth of 550 yards, and circulating the same volume of air, the consumption would be 22 pounds of coal, and that of the mechanical ventilator 11 pounds, showing a saving of 50 per cent. That those calculations are based on the most reliable data we can fully believe, and the ventilator of Monsieur GUIBAL we also know has been adopted at several collieries with great success. At the present time a large one has just been started at the Manvers Main Colliery, near to Sheffield, and with the greatest success. When started it worked at the rate of about 45 strokes per minute, and produced 172,726 cubic feet of air per minute, or 8470 feet more than the furnaces. It can be worked at a much higher speed, and, if necessary, the ventilation can be brought up to more than 200,000 cubic feet of air per minute. This cannot be considered otherwise than in the highest degree successful. But it appears that there are other ventilators at work in different parts of the kingdom. One of these is the Struvé Ventilator, consisting of pistons working up and down alternately in troughs of water, taking the air into the mine in the upstroke, and discharging it through a large number of flap valves into the atmosphere in the downstroke. In speaking of it, Mr. MORRISON says its percentage of useful effect never exceeds 40 per cent. of the indicated horse-power of the engine under the most favourable conditions.

The Nixon ventilator, it appears, is at work in North Wales, and is in construction somewhat similar to the Struvé, or at least an adaptation of it. The Lemielle Fan in its action is said to resemble the principle of the rotary pump, being a drum or hollow cylinder placed on a vertical axis, revolving eccentrically in a cylindrical chamber, round the walls of which it is constantly carrying three or more blades. The air is carried round in the spaces between those blades, and is forced out into the atmosphere as the spaces diminishes from the action of the eccentric drum. There is also the Biram Fan (the same, if we mistake not, as that at the Elsecar Colliery, to which we have alluded), the Rammell, and the Waddle. It appears by experiments made by the officials of the Belgian Government with regard to the Guibal that without the casing the useful effect obtained was 22 per cent., with the casing 31 per cent., with casing and expanding chimney 57 per cent., and with casing and with shutter adjusted 61 per cent. Mr. Morrison, in alluding to the Guibal Fan, in illustrating its power as compared with other ventilators, gives some interesting figures, based upon a mine in which the conditions are 100,000 cubic feet of air per minute under a water-gauge of 3 in. He takes the ordinary furnace, the Guibal, and the Waddle (or Rammell), and shows the saving effected by the Guibal Fan. The following are the figures:—

	Consumption of coal lbs. per h.-p. per hour.	Tons per day.	Tons per annum.
Furnace	5·00	25·180	9190
Waddle	1·76	8·862	3237
Guibal	1·526	5·788	2112

Under conditions of ventilation represented by 100,000 cubic feet of air under the lesser drag of 1 in. of water-gauge, the consumption would be with a ventilator about 1251 tons per annum, but to do the same amount of work the furnace would require at least 3880 tons per annum, thus effecting a saving in favour of the ventilator of 2629 tons, and which is calculated at the present cost of coal would amount to several hundreds of pounds. From what has been done at several places we understand there is no difficulty in replacing the furnace with the ventilator, which it is evident would effect a very great saving, besides being more efficient as regards ventilation. We understand that there are more than 50 of the fans at work in various mining districts in England, and we do know that they are being much appreciated by colliery proprietors, and that mechanical ventilation is now making great progress in the country.

THE COAL FIELDS OF RUSSIA.

"Russia," said a Moscow coalowner the other day, "is the future coal supplier of the world. We have neglected our resources too long, and now we must begin to utilise them in earnest. A few more railways, a few more mining companies, a few more appliances of working and transport, and we shall pour our coal into every market of the East, and bring the price of fuel in Europe itself lower than it has ever been before." Whether this daring prediction will be accomplished remains to be seen; but there can be no doubt that Russia's traditional character as a purely wood-consuming country has caused her stores of coal to be immensely undervalued. The same cause has paralysed the mining activity of the country itself, but, thanks to the wood famine which has set in within the last 18 months, all this is at an end once and for ever. The possibility recently laid before Russia by her own *savants* of being left without a single cord of wood in less than half a century, is one which nobody can look upon with indifference in such a climate.

The chief centres of the Russian coal supply are as follow:—In the South, the basin of the Lower Don, which of itself contains 16,000 square miles of the finest anthracite; in the West, the Governments of Kiev and Kharkoff, which are daily attracting fresh explorers, and adding almost monthly to the list of new discoveries; and further to the North, the great central or Moscow basins, comprising the Governments of Tver, Kalouga, Moscow, Riazan, Tula, and Novgorod, and extending northwards as far as the Dwina. The official estimates made in December, 1871—since which time many rich beds have been discovered—rate the supply as follows:—Basin of the Lower Don, 15,000,000,000 poods (the pood being 36 lbs. English); Government coal fields of Poland, 516,000,000 poods; Moscow basin, 15,000,000,000 poods; Kiev Government, 80 miles of superficies by 21 feet of thickness (actual contents not specified). When to these items are added those of the Kharkoff and Ekaterinoslay beds of anthracite, the new strata which are being constantly discovered in the eastern provinces, and the private coal fields of the Privislinski Krai (the districts lying to the east of the Vistula), it will be seen at a glance that, so far as mere quantity goes, the vaunt of the Moscow coalowner was fully warranted. But it must be confessed that till within the last few months these great resources have been very inadequately utilised. The contrast between the existing state of things and the result which might have been achieved under different management is graphically summed up in a single passage of the report lately published upon the coal question by an eminent native expert, one of the shrewdest and least utopian men whom I have the pleasure of knowing.

"The total yield of our coal fields in 1867 (says he) was only 14,347,925 poods, whereas, with greater facilities of working and of transport, we could easily have disposed of 170 millions for Central Russia and the South alone—Moscow, 26,000,000 poods; Volga steamers, 40,000,000; railways, 34,664,000; factories, distilleries, &c., 49,315,000; Odessa, 359,000; the Black Sea and Egypt, 19,908,634: total, 172,646,634. Our two great obstacles are—1. Want of confidence in the coal veins as a safe investment of capital; 2. Want of transport for the coal when worked out. Till these hindrances are removed we can do nothing."

And well might he say so. The history of the Russian coal fields for the last four years might well appear incredible even to those who are habituated to regard the Muscovite as the *beau ideal* of a do-nothing. When the latest discoveries of coal in the year 1869 were made in the Tula Government the scientific commission sent to examine the strata reported that all that was necessary in order to render the undertaking profitable in the highest degree was the construction of tramways from the shafts to the nearest lines of rail; but the tramways were never constructed, and the working of the shafts has consequently all but ceased from sheer want of transport. The same cause has ruined the working of two coal beds in the Government of Riazan, which, according to the published report, would have been able to supply the Morshanks, Saratoff, and Tsartzin railways with 20,000,000 poods of coal annually. Thanks to the expenses of carriage, a pood of Tula coal, which sells at the pit mouth for 2¼ kopecks (about ¼d. English), costs 11 at Moscow; and the same cause makes the anthracite coal of the Lower Don, which costs from 7 to 10 kopecks per pood at Novo-Tcherkask, which lies close to the actual field, vary from 9 to 10 kopecks at Rostoff-super-Don, from 12 to 15 at Taganrog, and from 20 to 21 at Odessa.

Even this is not all. The Moscow-Tula Railway actually began to use coal fuel about two years ago, consuming 3,000,000 poods (at about from 6 to 14 kopecks the pood) in the first twelve months; and the coalowners, emboldened by success, were just beginning to send large quantities to Moscow, when the directors of the line, for reasons best known to themselves, ordered the resumption of wood fuel; in consequence of which the works fell to decay, and the proprietors were all but ruined.

But all this is now in a fair way to be remedied. The magnificent anthracite fields of the Lower Don (the coal of which in burning leaves only 1½ per cent. of ashes) are now traversed by lines of rail from one end to the other. Tramways and railways are being constructed through every part of the great central basin, and the Government is exerting itself to cheapen the cost of transport. Locomotives specially adapted for coal fuel are being imported from America, and a train has recently been run upon the Moscow line under these conditions, at a speed of 40 miles an hour. No fewer than six new companies—the Moscow Basin, the Ilsed, and four others, with an aggregate capital of 16,000,000 roubles, or upwards of 2,000,000*l*.—have been formed for working the great central basin, and the price of coal is falling rapidly both at Moscow and St. Petersburg. In a word, the way seems to be clear for the scheme breached by Count Rostovtzeff two years ago in his "Remarks upon the Coal Question":—"My plan would be to form one great company with a capital of 2,000,000 silver roubles (about 300,000*l*.), with power to issue paper to a like amount in case of need. To this company should be conceded the right of search upon all Crown lands, and the privilege of constructing railways to connect the workings with the nearest lines of rail or the actual centres of demand, the construction of such railways being held to be warranted by the assurance of a yield of 12 or 15 million poods annually for 80 years, with the prospect of a continuous demand. Providence has endowed us with mighty resources; it is for us to utilise and develope them."

BORING MACHINES.—Mr. C. J. BALL, of New Bridge-street, has patented some improvements in machinery and apparatus for drilling and boring holes. The invention relates to an improved method of driving the slide-valve of the cylinder of boring machines, and consists of making the upper and lower parts communicate with the opposite ends of the cylinder respectively, and forming projections upon the valve or a rod connected to it, which projections are struck by tappets, so that the valve is moved in the same direction as the piston. Also, of a method of altering the relative sizes of the upper and lower ports, so that more steam may be admitted below and less above the piston, as the weight of the boring rods increases. In some cases 74 lbs. of wrought bar iron, 14 ozs. of tungsten, 14 ozs. of spiegelisen, 8 ozs. of charcoal, and ½ oz. of black oxide of manganese are employed and treated as usual in a crucible. Steel thus produced will weld without the usual chemicals employed for that purpose, will make tools capable of receiving clean sharp edges, and be perfectly malleable and tough. In the above process the inventor prefers to use Swedish roll bar of the K.B. brand.

PHOSPHORUS.—Mr. J. H. PLAYER, of Birmingham, has patented an invention which consists in utilising the gaseous phosphorus compounds obtained in the manufacture of phosphorus, by passing the said gaseous compounds through a solution of sulphate of copper; by this treatment phosphide of copper is obtained. The invention further consists in adding phosphorus to copper and alloys of copper, for the purpose of giving tenacity and other valuable properties thereto, by the use of phosphide of copper, instead of uncombined phosphorus, as commonly practised.

STEEL.—Mr. T. BROOKS, of Minerva, Ohio, has patented some improvements in the manufacture of steel. According to one arrangement the ingredients are by preference taken in the following proportions:—74 lbs. of bar-iron, 14 ozs. of tungsten, 8 ozs. of charcoal, 3 ozs. of manganese, 8 ozs. of fluor-spar or chlorophane, and are treated as usual in a smelting pot. When a finer quality of tool welding steel is required, 2½ ozs. of calcium tungstate is substituted for the tungsten. In producing a file steel he uses by preference about 74 lbs. of Bessemer scrap, or rail bar, 1½ lb. of cast-iron, or 2 lbs. of fluor-spar or chlorophane, ½ oz. manganese, 1½ oz. of charcoal, 1 oz. of bismuth, and the same is treated in a smelting furnace.

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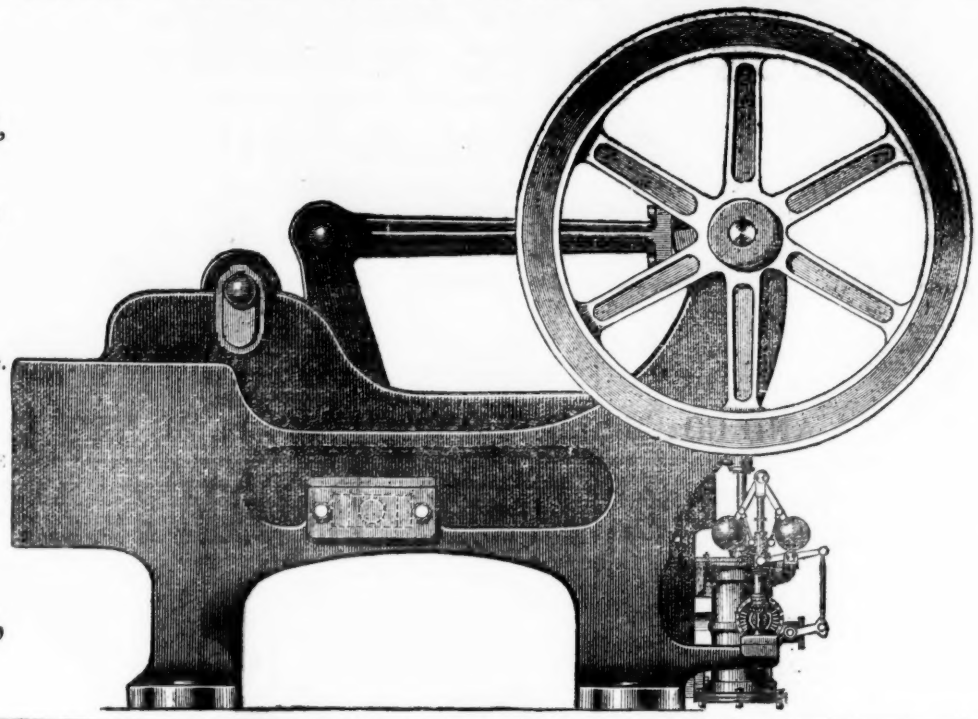

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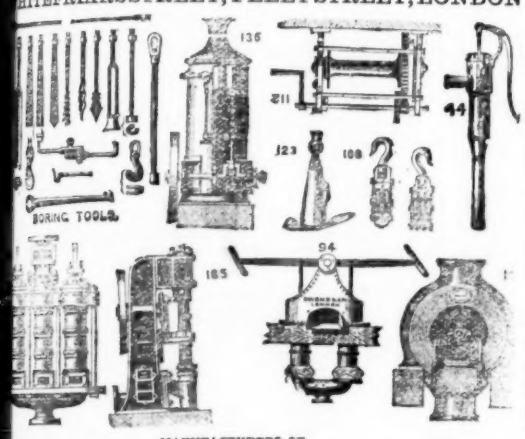

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The above drawing shows the construction of this cheap and handsome roof, now much used for covering factories, stores, sheds farm buildings, &c., the principal rafters which are double bow and string girders of best pine timber, sheeted with ½ in. boards, supported on the girders by purlins running longitudinally, the whole being covered with patent waterproof roofing felt. These roofs so combine lightness with strength that they can be constructed up to 100 ft. span without centre supports, thus not only affording a clear wide space, but effecting a great saving both in the cost of roof and uprights.

They can be made with or without top-lights, ventilators, &c. Felt roofs of any description executed in accordance with plans. Prices for plain roofs from 30s. to 40s. per square, according to span, size, and situation.

Manufacturers of PATENT FELTED SHEATHING, for covering ships' bottoms under copper or zinc.

NONPAREIL FELT for lining damp walls and under floor cloths.

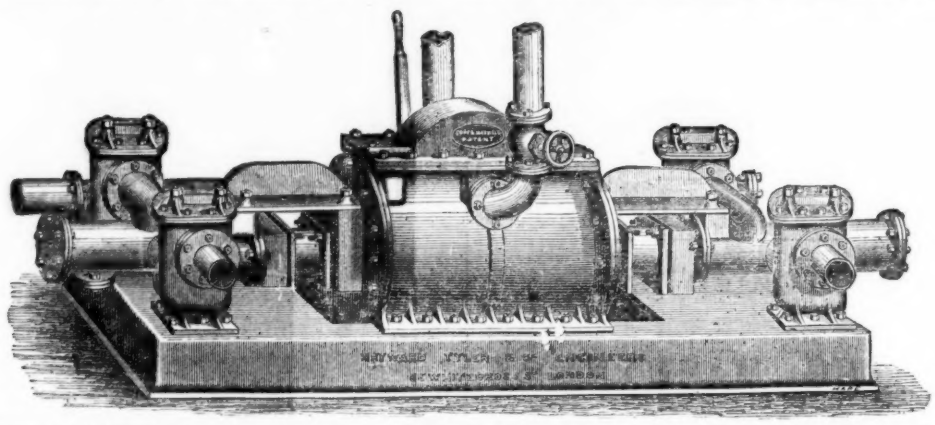
DRY HAIR FELT, for deadening sound and for covering steam pipes, thereby saving 25 per cent. in fuel by preventing the radiation of heat.

PATENT ASPHALTE ROOFING FELT, price 1d. per square foot.

Wholesale buyers and exporters allowed liberal discounts.

PATENT ROOFING VARNISH, in boxes from 3 gallons to any quantity required 8d. per gallon.

HAYWARD TYLER AND CO.'S
PATENT STEAM PUMPING MACHINERY.



"About a year and a-half since a direct-acting pumping-engine was erected at the Trimdon Grange Colliery by Messrs. Hayward Tyler and Co., of London. The diameter of the steam-cylinder of this engine is 40 in., that of the rams 16 in., the pump-plungers having a 4-ft. stroke. The whole of the combined apparatus is carried on a solid bed-plate, and the pumps are so arranged that they can be drawn off endways, if required, a planed groove being formed in the bed plate to keep them true. A pumping-engine of this description requires no very accurate adjustment of level, as it is self-contained, and all the strains are direct from the steam-cylinder to the pumps, which at their underside are attached to the bed-plate, and are supported by a strong stay above. The engine at the Trimdon Colliery is placed in a headway cut for its reception, at a depth of 400 ft. from the surface, and a short distance from the main shaft. The pump takes its water from sump, into which the level drains. The pumping-engine continues to do its work in a satisfactory manner, and at a recent trial made by Mr. R. Forster, engineer it was found that the pump was throwing to bank, a distance of 400 ft. above itself, 245½ gallons of water per minute, the pump running at 10 strokes, thus doing 89·5 per cent. of its theoretical duty."—See *Engineering*, 3rd Jan., 1873.

Full particulars, references, testimonials, &c., post free, on application to—

HAYWARD TYLER AND CO.,
84 AND 85, UPPER WHITECROSS STREET, LONDON, E.C.

THE DIAMOND DRILL.

PROSPECTING OR TRIAL BORING FOR MINERALS

The DIAMOND ROCK BORING COMPANY (LIMITED) is PREPARED to UNDERTAKE CONTRACTS at FIXED RATES for PROSPECTING or BORING for MINERALS of all kinds. Great speed is attained; work that formerly took years is done in the same number of months, and sample cores are brought up, showing the nature of the strata passed through, and enabling the minerals obtained to be analysed.

The company has a number of MACHINES in SUCCESSFUL OPERATION in different parts of ENGLAND, and the terms, with particulars, will be supplied upon application to—

THE SECRETARY, DIAMOND ROCK BORING COMPANY, LIMITED,
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BOLTS AND NUTS. BOLTS AND NUTS.

MADE BY PATENT MACHINERY.

Suitable for Engineers, Millwrights, Coach and Wagon Builders, Colliery, and other Purposes.

AN EXTENSINE ASSORTMENT OF OVER 200 TONS ALWAYS IN STOCK.

From which orders can be promptly executed. Every description of Bolts and Nuts made to order.

BAR IRON. BAR IRON.

OVER 1000 TONS OF BARS, PLATES, SHEETS, ANGLES, HOOPS, SQUARES, ROUNDS, AND FLATS.

All of First-class Quality.

RAILWAY, COLLIERY, AND TRAM RAILS, TO ANY SECTION.

A large Stock of Anvils, Vices, Tue Irons, Smiths' Bellows, Files, Rasps, Picks, Spades and Shovels, Sledge and Hand Hammers, Best Swedish Horse Nails, Back Bands, Plough Traces, Best Spring, Cast, Double Shear, and Blister Steel.

JOHN STANSFELD (late Stansfeld and Sons), Iron Merchants, Bolt and Nut Manufacturers,
ALFRED STREET BOAR LANE, LEEDS.

ROCK DRILLING MACHINERY.

Brydon Davidson, and Warrington's Patent.

References, particulars, Estimates, &c., Sent on application.

CHARLES BALL AND CO., lately Sole Agents for
THE BURLEIGH ROCK DRILL,

ARE NOW PREPARED TO SUPPLY THEIR NEW

ROCK-BORING MACHINE, OR "POWER JUMPER,"

Which they consider far superior to any other Rock-boring Machinery existing, and which they have, therefore, undertaken to bring before the public. The Firm's principle

"INVENTORS OF NONE—AGENTS FOR THE BEST"

Secures to its customers the best known machinery, as the Firm is entirely impartial in its adoption of any particular style of machines.

THE "POWER JUMPER"

Is recommended to the public on account of its qualities, which are the following. It is—

CHEAPER,
SIMPLER,
LIGHTER,
SHORTER,
THAN ANY OTHER.
COMPARISON INVITED.

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FOR SALE.

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OSWALD BROOKE AND CO.,

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MANCHESTER,

PATENTEES AND SOLE MANUFACTURERS
OF
GOVERNMENT
FIREPROOF
BRATTICE CLOTH
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AIR TUBING.

WORKS: COLLYHURST.

ESTABLISHED 1852.

WEIGHING MACHINERY.

HODGSON AND STEAD,

MANUFACTURERS,

Egerton Works & Hope Foundry,

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THE
RAILWAY SPRING COMPANY,
MILLSANDS, SHEFFIELD,

Having purchased from the Trustee of the late Firm of W. Charles and Co. the extensive works, with the valuable and improved machinery, are prepared to execute orders for every description of
RAILWAY SPRINGS.

HEPBURNS'
PUMP LEATHER
WATERPROOF

By a special method of preparation, this leather is made solid, perfectly close in texture, and impermeable to water; it has, therefore, all the qualifications essential for pump buckets, and is the most durable material of which they can be made. It may be had of all dealers in leather, and of—

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TANNERS AND CURRIERS, LEATHER MILLBAND AND HOSE PIPE MANUFACTURERS,
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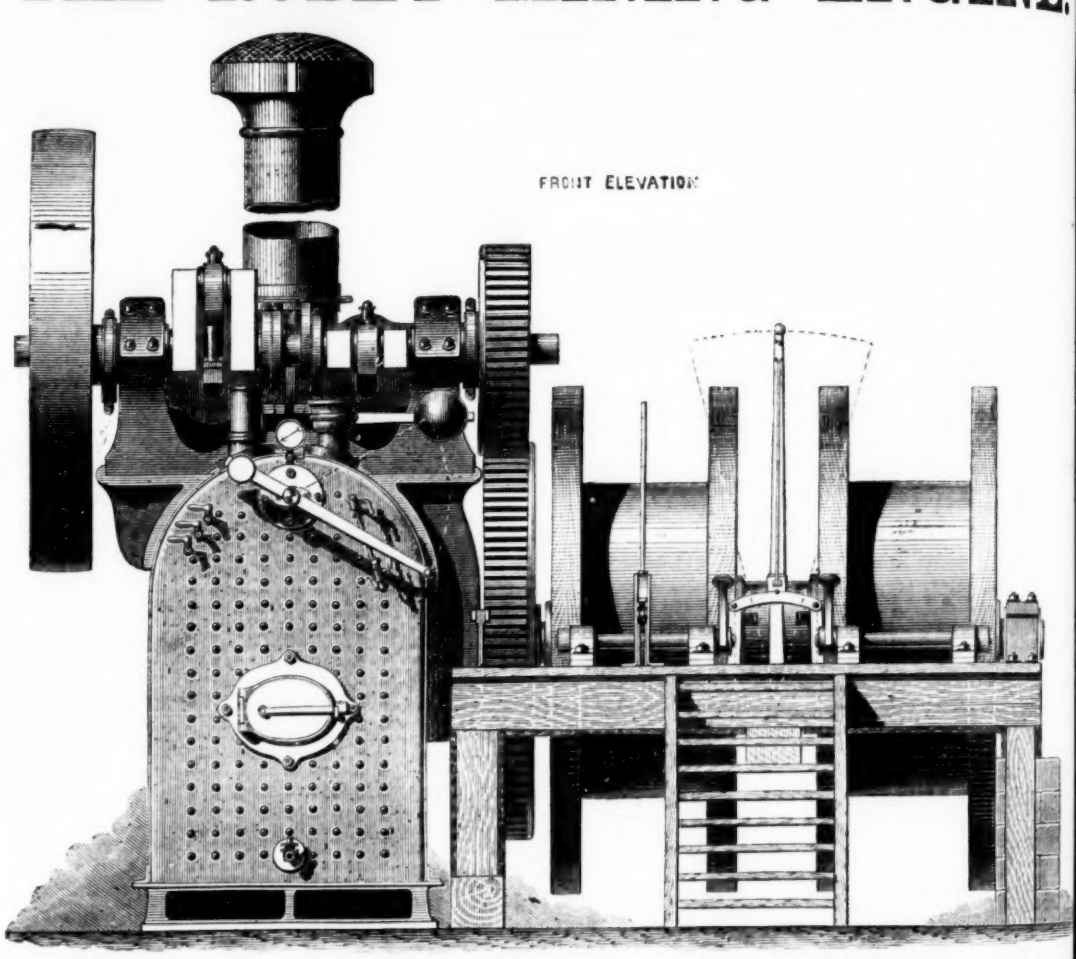
Prize Medals, 1851, 1855, 1862, for
MILL BANDS, HOSE, AND LEATHER FOR MACHINERY PURPOSES.

THE GREAT ADVERTISING MEDIUM FOR WALES.

THE SOUTH WALES EVENING TELEGRAM
(DAILY), and
SOUTH WALES GAZETTE
(WEEKLY), established 1857,
The largest and most widely circulated papers in Monmouthshire and South Wales.
CHIEF OFFICES—NEWPORT, MON.; and at CARDIFF.

The "Evening Telegram" is published daily, the first edition at Three P.M., the second edition at Five P.M. On Friday, the "Telegram" is combined with the "South Wales Weekly Gazette," and advertisements ordered for not less than six consecutive insertions will be inserted at an uniform charge in both papers.
P. O. O. and cheques payable to Henry Russell Evans, 14, Commercial-street, Newport, Monmouthshire.

THE ROBEY MINING ENGINE.



FROM 20 TO 200 EFFECTIVE HORSE-POWER.

FOR FULL PARTICULARS AND PRICES, APPLY TO—

ROBEY AND COMPANY, LIMITED,
PERSEVERANCE IRONWORKS, LINCOLN.

ALSO OF PATENT PORTABLE

HAULING AND WINDING ENGINE
WITH
PATENT DRUM WINDLASSES,
FOR MINING PURPOSES.

This Engine is specially commended to Mining Engineers and others, as by its adoption—
Haulage along inclined drifts is easily and cheaply effected;
The expense of sinking new shafts is greatly reduced, neither foundations nor engine-house being required
It is available not only for winding, but for pumping, sawing, &c.—a great desideratum at a large colliery;
It can be very quickly removed (being self-propelling), and fixed in any desired position.
Prices and full particulars on application as above, and also references to view the engine in successful work near Derby, Carnarvon, Haverfordwest, Darlington, Durham, Penzance, and other places.

THESE ENGINES WORK WITH MARVELLOUS ECONOMY IN FUEL.

CHAS. PRICE AND CO.'S RANGOON ENGINE OIL,

AS SUPPLIED TO H.M. DOCKYARDS AND FLEET.

THIS OIL is suitable to every kind of Machinery. As a lubricant it is equal to the best Sperm or Lard Oil, while it possesses the great advantage of being entirely free from any principle which will corrode the metal bearings.

For particular kinds of Machinery, the Oil may be specially prepared of a consistency and character adapted to the nature of the work to be done.

"Chemical Laboratory, 7, Printing House-square, Blackfriars, April, 1869.

"I herewith certify that the Rangoon Engine Oil, manufactured by Messrs. Chas. Price and Co., is free from any material which can produce corrosion of the metal work of machinery. It is indeed calculated to protect metallic surfaces from oxidation.

"The lubricating power of this oil is equal to Sperm or Lard Oil.

"T. W. KEATES, F.C.S., &c, &c

Every parcel of the Oil sent from the work bears the Trade Mark of the Firm.

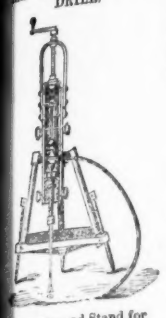
LONDON: CASTLE BAYNARD, UPPER THAMES STREET.
WORKS: MILLWALL, POPLAR; and ERITH, KENT

THE "BURLEIGH" ROCK-DRILLING MACHINERY.

THOMAS BROWN,

PATENTEE AND SOLE PROPRIETOR.

THE "BURLEIGH" ROCK DRILL.



Machine and Stand for QUARRYING and SINKING.

This celebrated ROCK DRILL, which by reason of its inherent merits has superseded all other Rock Drills, is now in extensive use in America, England, Scotland, and the Continent, and is indispensable in the economic working of all Railway Cuttings, Shafts, Quarries, and Mines.

Its prominent features are:—

I.—ITS SIMPLICITY.

Any labourer can work it, and it does not get out of order. It may be worked either by air or steam power, at will, without any alteration of the mechanism.

II.—ITS DURABILITY.

No part of the mechanism is exposed; it is all enclosed within the cylinder—so there is no risk of its being broken.

III.—ITS CAPABILITY.

In hard rock, like granite, gneiss, ironstone, quartz, the Tunnel Drill will progress at the incredible rate of 6 inches to 12 inches per minute. These machines can bore holes from 1 inch up to 5 inches in diameter, and, on an average, will go through 120 feet of rock per day—making 40 holes each from 2 to 3 feet deep. The drill can be used at any angle, and in any direction, and will drill and clear itself to any depth up to 20 feet.

IV.—ITS ECONOMY.

As compared with hand labour the saving in actual drilling is very considerable, from the fact of the "out put" being increased fourfold. The saving in the general expenses, and in the interest of capital, will be in a like ratio.

DRILL POINTS.

The saving in steel alone is incredible, ONE DRILL POINT WILL GO THROUGH TWENTY FEET OF ABERDEEN GRANITE WITHOUT SHARPENING. This fact will be duly appreciated by practical men.

For testimonials, estimates, and other information, apply to—

T. BROWN & CO., Engineers, 96, Newgate-street, London, E.C.

WILSON, McLAY, & CO., Sole Agents, 2, Talbot-court, Gracechurch-street, London, E.C.; and 87, St. Vincent-street, Glasgow.

CRAVEN BROTHERS, Engineers (the Makers), Vauxhall Ironworks, Osborne-street, Manchester.

THE "BURLEIGH" AIR COMPRESSOR,

THOMAS BROWN,

PATENTEE & SOLE PROPRIETOR.

For driving the "Burleigh" Drill, or other Machinery.

The peculiar advantages which enhance the value of this Machine in the estimation of those who have it in practical use are—

1.—The pump pistons are driven by a steam-engine, the connection rods being attached to one crank shaft, the angles being so set that when the greatest power is developed in the steam cylinder the point of the greatest compression is being reached alternately in the air cylinders.

2.—The heat generated by compression of the air is reduced to *nil*.

3.—It is strong and durable compared with its effective power.

For further particulars, and all information relating thereto, please address—

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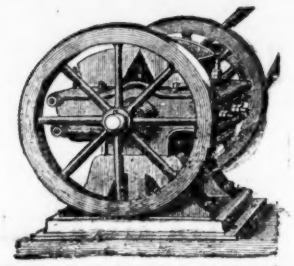
VAUXHALL IRON WORKS, OSBORNE STREET, MANCHESTER.



Machine No. 1—The Direct Double-Action.

IMPROVED

PATENT STONE BREAKING, QUARTZ CRUSHING, AND GRINDING MACHINERY.

Messrs. T. BROWN and Co., ENGINEERS, have much pleasure in calling attention to their IMPROVED MACHINERY for STONE BREAKING and QUARTZ CRUSHING, for crushing, grinding, or triturating Stone, Flint, Minerals, Ores, Chemicals, and other substances; for washing and separating Metals from Ores, and for extracting Gold from Quartz.

The principle of this invention is applied to machines of various construction, which contain within the range of their capability the power of reducing all hard materials to cubes of from 2½ inches to impalpable powder. The mechanical construction of each description of machine is specially adapted for its own peculiar work, and experience has shown that each is eminently suited for the work for which it is designed.

They can be driven by water, steam, or horse power; they are light and portable, and their crushing and grinding surfaces are so constructed that when worn they can easily be replaced.

If intending purchasers would send a sample of the materials required to be crushed or broken it could be operated upon in their presence, and thus they would be guided in the selection of the machine best suited for their requirements.

For prices, and all information relating thereto, please address—

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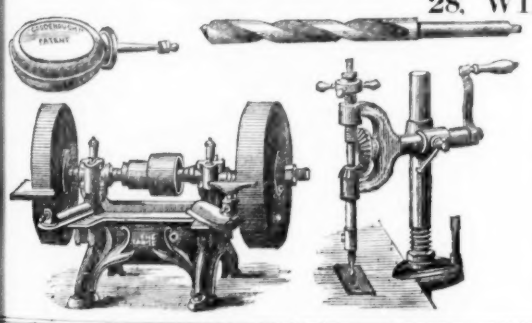
CHARLES CHURCHILL AND CO.,

IMPORTERS AND FACTORS OF AMERICAN MACHINERY AND TOOLS,

28, WILSON STREET, FINSBURY, LONDON, E.C.

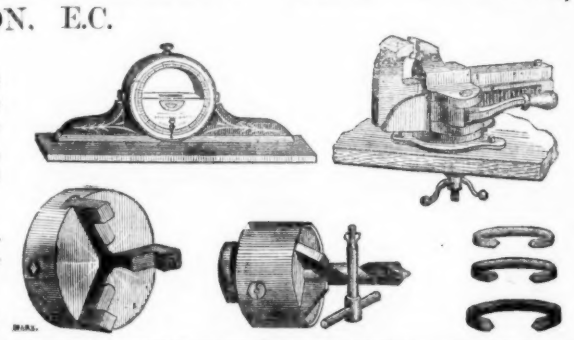


SOLE AGENTS FOR

Morse's Twist Drill, and Machine Company's celebrated Twist Drills and Chucks; American Scroll Chucks; Stephens' Patent Vices; Parker's Patent Parallel and Swivel Vices; Gould Manufacturing Company's Well and Cistern Pumps; Washita, Arkansas, and Hindostan Oil Stones; and all other descriptions of American Tools and Machinery, &c., &c.

C. C. and Co. are prepared to give quotations and execute indents for American Goods of all descriptions, to be shipped to any port.

CATALOGUES AND PRICES CURRENT ON APPLICATION.



CHAPLIN'S PATENT PORTABLE STEAM ENGINES AND BOILERS.

PRIZE MEDAL, INTERNATIONAL EXHIBITION, 1862.

STATIONARY ENGINE, From 1 to 30-horse power. No building required.

PORTABLE HOIST, 1 to 30-horse power. With or without jib.

STEAM CRANE,* 30 cwts. to 20 tons. For wharf or rail.

CONTRACTORS' LOCOMOTIVE, 5 to 27-horse power. For steep inclines and quick curves.

TRACTION ENGINES, 6 to 27-horse power. Light and heavy

SHIP'S ENGINES, Winding, Cooking, and Distilling. Passed by Government for half water.

* These cranes were selected by H.M. Commissioners to receive and send away the heavy machinery in the International Exhibition.

From the STRENGTH, SIMPLICITY, and COMPACTNESS of these ENGINES they are extensively USED for GENERAL PURPOSES, and also in situations where STEAM-ENGINES OF THE ORDINARY CONSTRUCTION CANNOT BE APPLIED.

ALEXANDER CHAPLIN AND CO.,

PATENTEES AND SOLE MANUFACTURERS,

CRANSTON HILL ENGINE WORKS, GLASGOW.

ENGINES OF EACH CLASS KEPT IN STOCK for SALE or HIRE, and ALL OUR MANUFACTURES GUARANTEED as to EFFICIENCY, MATERIAL, and WORKMANSHIP.

Parties are cautioned against using or purchasing imitations or infringements of these patent manufactures.

AGENTS IN LONDON FOR THE SALE OF OUR MANUFACTURES: WIMSHURST AND CO.

WALKER'S

PATENT CENTRAL-LIFT STAMPS.

This is the MOST IMPORTANT INVENTION for CRUSHING ORES AT A SMALL COST.

For all new mines they are invaluable.

Can be SEEN at WORK every day at 12, JAMES STREET, OLD STREET, E.C., near CITY ROAD.

THOMAS WARDEN,

LIONEL STREET, BIRMINGHAM,

IRON AND STEEL MERCHANT,

Manufacturer of Every Description of Railway, Colliery, and Contractors Plant.

A LARGE STOCK OF SECOND HAND RAILS AND PLANT ALWAYS ON HAND.

VIENNA EXHIBITION, GROUP XIII, STAND No. 457. INTERNATIONAL EXHIBITION, LONDON, No. 2 ENGINE SHED, WEST SID

TANGYE BROTHERS AND HOLMAN

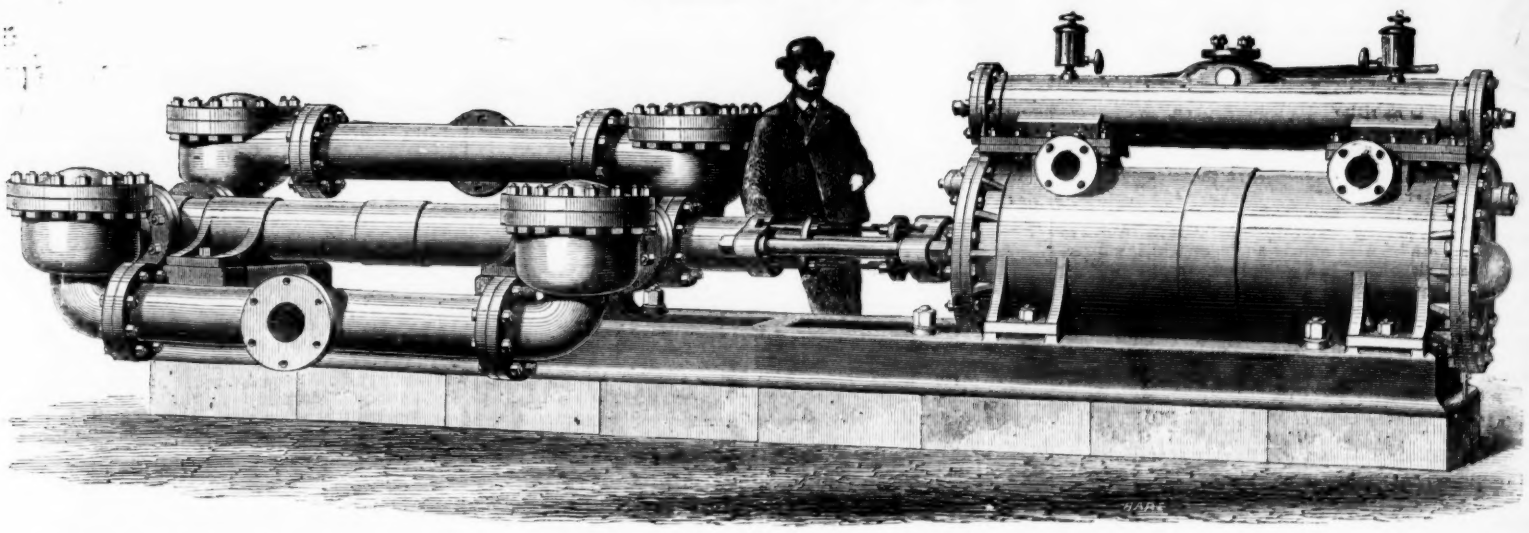
10, LAURENCE POUNTNEY LANE, LONDON,

CORNWALL WORKS (TANGYE BROTHERS), BIRMINGHAM,
NEWCASTLE-ON-TYYE (TANGYE BROTHERS AND RAKE), OFFICES AND WAREHOUSE, ST. NICHOLAS' BUILDINGS.
SOLE MAKERS OF

THE "SPECIAL" DIRECT-ACTING STEAM PUMPING ENGIN

FOR FORCING WATER FROM MINES.

Nearly 3000 in Use.



The "SPECIAL" Direct-acting Steam Pumping Engines require no costly Engine Houses or massiv foundations, no repetition of Plunger Lifts, ponderous Connecting-rods, or complication of Pitwork, an allow a clear shaft for hauling purposes.

Extract from "ENGINEERING," September 6th, 1872:—

"The accompanying engraving illustrates a large specimen of the 'Special' Steam Pump, which was brought before the public about four years since by Messrs. Tangye Brothers and Holman. The Pump is the invention of Mr. S. Cameron, of New York, and since its introduction Messrs. Tangye have turned out nearly 3000 from their works.

"These pumps are of various sizes, and at first only small ones were made, but as their usefulness became developed the manufacturers designed pumping engines on the same principle for use in collieries. They were first applied to this purpose in the Newcastle collieries about three years since, and through the efforts of the late Mr. A. Stansfield Rake, under the direction of Messrs. Tangye, about 130 of these pumps had been introduced—principally in the collieries of the Durham and Newcastle districts, up to the end of 1870. They were adapted to perform the required duty—varying in almost every case—of forcing from 1000 to 10,000 gallons per hour from depths ranging from 100 to 500 ft. The succes of this system of pumps led Mr. J. Bigland, the manager of Messrs. Pease's Bishop Auckland Collieries, to conclude that it was adapted for yet heavier work. The result of his investigations into its working led to the manufacture of the engine we have illustrated, for the Adelaide Collieries, belonging to Messrs. Pease, at Bishop Auckland.

"The construction of the Special Steam Pump is so well known that we need now do no more than refer to the dimensions of the various parts. The steam cylinder is 26 in. diameter, and the pump—which is double acting—is 6½ in. diameter, with a 6-ft. stroke. The slide valve is steam-moved, and its alternate action is effected by means of two steel reversing valves, operated by the piston in the interior of the cylinder at either end. Hence there is no external mechanism except the piston rod, a few inches only of which is seen reciprocating between the stuffing boxes of the steam and pump cylinders. In the contract it was stipulated that the engine should raise 120 gallons per minute 1040 ft. high in a single lift, and this is more than accomplished, with apparently as much ease as if its load was delivered at only 100 ft. high.

"The engine-room at the Adelaide Collieries is situated at a depth of 1040 ft. below the surface, and is an arched chamber, about 100 ft. long by 20 ft. wide, and 10 ft. high at centre. At the far end of this chamber is a double-flued boiler, 27 ft. long and 7 ft. in diameter. Placed between the boiler and the shaft is the pumping engine we have been describing. It was started on June 6, 1871, and Mr. Bigland reported that, having measured its duty, he found the average of seven trials to be 137 gallons per minute, thus giving a higher duty than was stipulated for in the contract.

"A still larger Special Steam Pump than the one already described has since been made by Messrs. Tangye for Messrs. Stannier lieries, Silverdale, Staffordshire. The steam cylinder of this is 32 in. in diameter, and the water cylinder 10½ in.; the st 6 ft., and the engine has to raise 22,500 gallons per hour 540 f Two out of eight engines for some extensive coal mines in Ge are also in a forward state; each of these engines is to be of raising 150 gallons per minute, or 9000 gallons per hou high. This system of underground pumping engine und carries with it the recommendations of simplicity and great with a small number of mechanical parts. Its first cost is als moderate, as compared with the method of raising water fro depths by a series of 40 or 50 fm. lifts. Its practical value tested in 1867 by the award of a silver medal by the Royal Fal Polytechnic Society, which is composed chiefly of mining en In fact, these engines appear to solve a very important com question in mining operations—viz., the most economical an tive means of deep mine drainage. Their success has be blished in the coal mines of Durham and Newcastle, and the reason why their adoption should not follow, as occasion re in the copper and tin mines of Cornwall, some of which are depth; and especially for foreign mines, where transport ence and economy are of paramount consideration."

The "Special" Steam Pumping Engines are in use at the following among many other Collieries:—

Adelaide Colliery, Bishop Auckland	3 Pumps.	North Bitchburn Colliery, Darlington	2 Pumps.	Stott, James and Company, Burslem	1 P
Acomb Colliery, Hexham	1 „	Newton Cap Colliery, Darlington	1 „	Straker and Love, Brancepeth Colliery	1
Blackfell Colliery, Gateshead	1 „	Normanby Mines	1 „	Seaton Delaval Coal Colliery, near Newcastle	1
Black Boy Colliery, Gateshead	1 „	Oakenshaw Colliery	1 „	Thornley Colliery, Ferryhill	2
Castle Eden Colliery	2 „	Pease's West Colliery	2 „	Thompson, John, Gateshead	2
Carr, W. C., Newcastle	4 „	Pease, J. and J. W., near Crook	5 „	Trimdon Grange Colliery	1
Etherley Colliery	1 „	Pease, J. and J., Brandon Colliery	1 „	Tudhoe Colliery	4
Gidlow, T., Wigan	3 „	Pegswood Colliery, near Morpeth	2 „	Vobster and Mells Colliery	2
Haswell, Shotton and Easington Coal Company	3 „	Pelton Fell Colliery	1 „	Widdrington Colliery, Morpeth	5
Lochgelly Iron and Coal Company	2 „	Railey Fell Colliery, Darlington	1 „	Whitworth and Spennymoor Colliery	5
Lochore and Capeldrae Cannel Coal Company	6 „	Right Hon. Earl Durham, Fence Houses	1 „	Westerton Colliery, Bishop Auckland	1
Leather, J. T., near Leeds	2 „	Skelton Mines	1 „	Wardley Colliery, Gatesheld	1
Lumley Colliery, Fence Houses	1 „	South Benwell Colliery	5 „	Westminster Brymbo Coal Company	2
Monkwearmouth Colliery, Sunderland	1 „	St. Helens (Tindale) Colliery	1 „	Weardale Coal and Iron Company	5

PARTICULARS OF THE "SPECIAL" STEAM PUMPING ENGINES SUITABLE FOR HIGH LIFTS IN MINES.

Diameter of Steam Cylinder ....Inches	6	8	10	8	12	16	10	14	18	21	14	18	21	26	16	21	
Diameter of Water Cylinder ....Inches	3	3	3	4	4	4	5	5	5	5	6	6	6	6	7	7	
Length of Stroke ....Inches	24	24	36	24	36	48	24	36	36	48	36	36	48	72	36	48	
Strokes per minute	30	30	20	30	20	15	30	20	20	15	20	20	15	10	20	15	
Gallons per hour	2,200	2,200	2,200	3,900	3,900	3,900	6,100	6,100	6,100	6,100	8,800	8,800	8,800	8,800	11,900	11,900	11
Height in feet to which water can be raised with 40 lbs. pressure per square inch of steam at pump	240	425	665	240	540	960	240	470	775	1,058	330	540	740	1,140	312	540	
Diameter of Suction and Delivery ...Inches	2	2	2	3	3	3	3½	3½	3½	3½	4	4	4	4	5	5	
Diameter of Steam Inlet ....Inches	¾	1¼	1½	1¼	2¼	2½	1½	2½	3	3½	2½	3	3½	4	2½	3½	
Diameter of Exhaust ....Inches	1	1½	1½	1½	2½	3	1¾	2½	3½	4	2½	3½	4	5	3	4	

PARTICULARS, &c.—*Continued.*

Diameter of Steam Cylinder ....Inches	30	18	24	30	32	18	24	30	36	21	30	36	42	26	36	44	
Diameter of Water Cylinder ....Inches	7	8	8	8	8	9	9	9	9	10	10	10	10	12	12	12	
Diameter of Stroke ....Inches	72	36	48	72	72	36	48	48	72	48	72	72	72	48	72	72	
Strokes per minute	10	20	15	10	10	20	15	15	10	15	10	10	10	15	10	10	
Gallons per hour	11,900	15,660	15,660	15,660	15,660	19,800	19,800	19,800	19,800	24,400	24,400	24,400	24,400	35,240	35,240	35,240	35
Height in feet to which water can be raised with 40 lbs. pressure per square inch of steam at pump	1,100	300	540	840	960	240	427	665	960	264	540	780	1,062	282	540	800	1
Diameter of Suction and Delivery ...Inches	5	6	6	6	6	7	7	7	7	8	8	8	8	10	10	10	
Diameter of Steam Inlet ....Inches	5	3	4	5	5½	3	4	5	6	3½	5	6	7	4	6	8	
Diameter of Exhaust.... Inches	6	3½	5	6	6½	3½	5	6	7	4	6	7	8	5	7	9	

PRICES OF THE ABOVE ON APPLICATION.

Any combination can be made between the Steam and Water Cylinders, to suit Height of Lift and Pressure of Steam.

TANGYE BROTHERS & HOLMAN, 10, Laurence Pountney Lane, London, E.C

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